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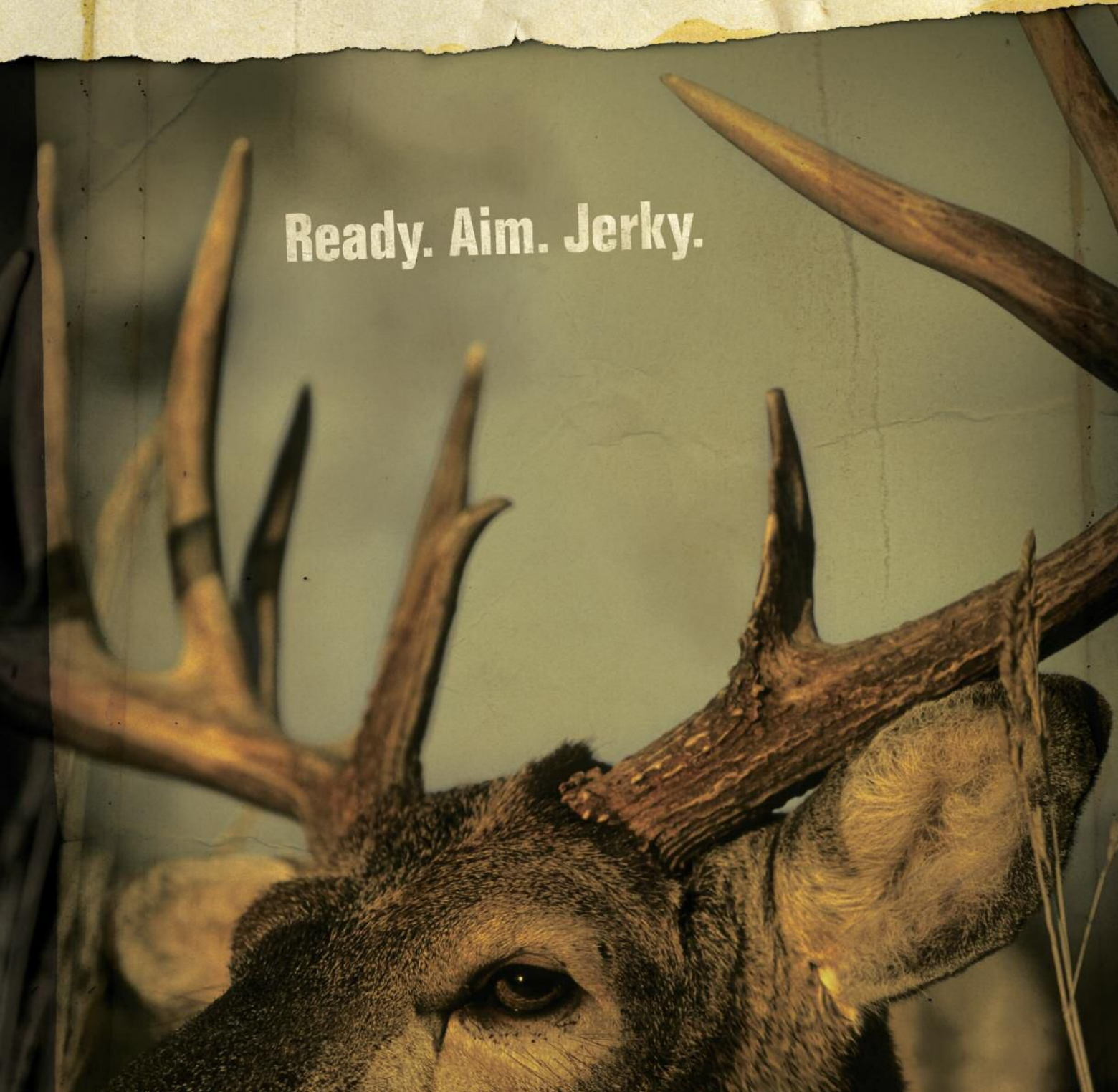
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On the cover . . . Winchester 1885 Low Wall .22 WMR with 2.5-8x 36mm Leupold (photo by Stan Trzoniec). Weatherby Vanguard Series 2 Kryptek Highlander .30-06 with Leupold VX-3 4.5-14x A.O. scope (photo by Brian Pearce). Steyr Arme Universal Gewehr (AUG).



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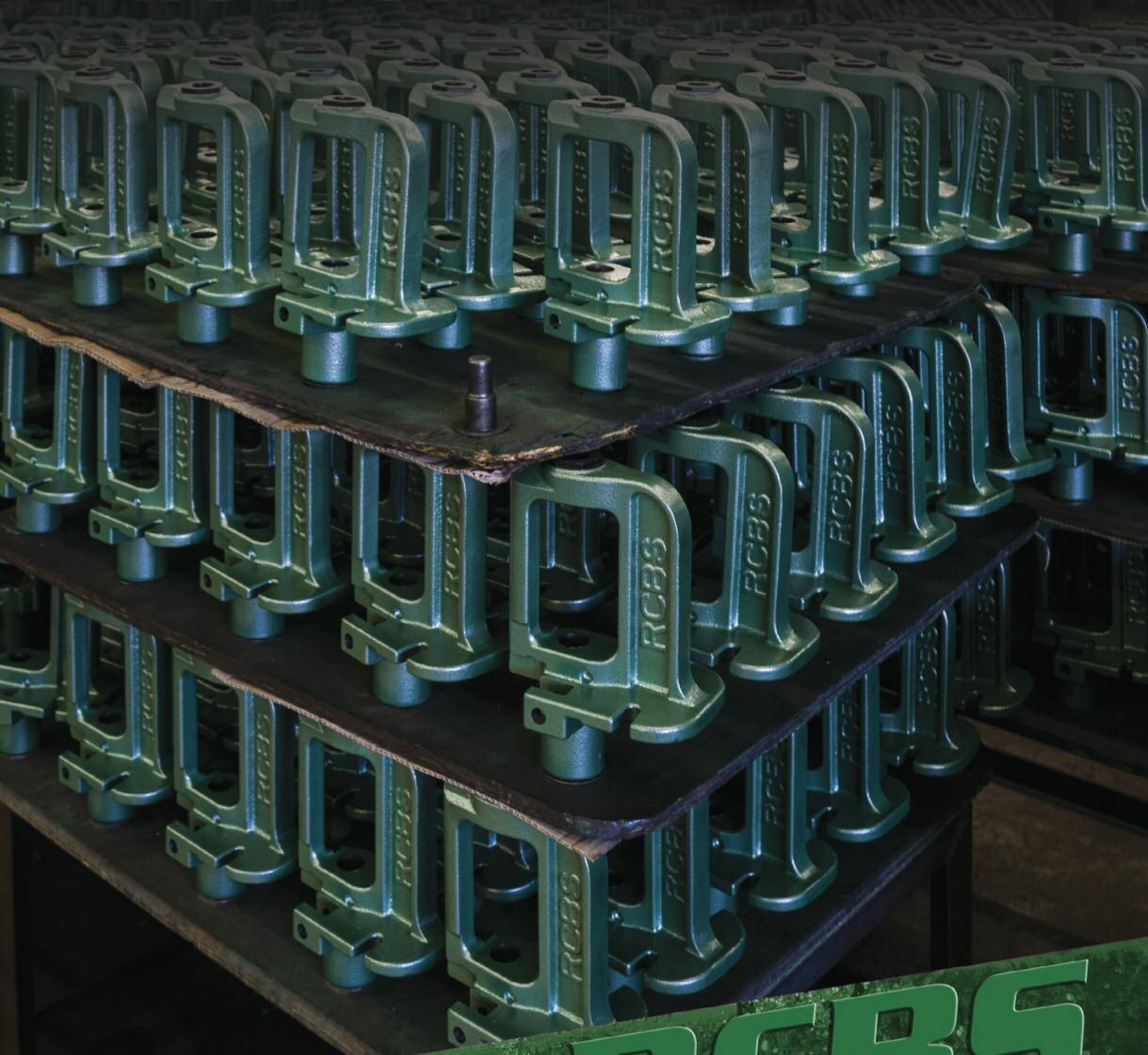


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WINCHESTER MODEL 1886

SPOTTING SCOPE by Dave Scovill

Legend has it that when T.G. Bennett, vice president of Winchester, purchased the manufacturing rights to John Browning's single-shot rifle, he returned to New Haven, Connecticut, with a wooden model of a new lever action that incorporated a locking bolt mechanism similar to that used in the single-shot rifle. The wooden model went on to become the Model 1886 lever-action repeating rifle that was patented on October 14, 1884.

On the other hand, Val Browning, John Browning's son, claims that John and his brother Matt delivered the prototype lever action to Bennett in New Haven some time after Winchester bought the rights to the Model 1885 single shot.

Either way, Winchester wound

up with the rights to what would become the Model 1886 and finally had a rifle that was capable of handling the .45-70 Government cartridge and could compete with the Marlin Model 1881.

While most references refer to the .45-70 as the "Government" cartridge, it is worthwhile to note that the cartridge Marlin chambered in the Model 1881 was properly referred to as the ".45-70 Marlin," owing the fact that the Marlin rifle required a flatnose bullet that was the proper overall loaded length to feed through the action. The flatnose bullet, of course, was required for the tubular magazine, which held cartridges end to end, with the nose of the bullet resting against the primer of the cartridge ahead of it.

So when the owner of a Marlin Model 1881 went into a sutler store to purchase ammunition, he wanted the .45-70 Marlin load, not the Government cartridge with either 405- or 500-grain roundnose bullets. After 1886, a similar distinction was made for the .45-70 WCF load used in the Winchester Model 1886, albeit the lever-action loads could be used in any .45-70 (aka 2.1-inch Sharps) single-shot rifle, and the Government loads could be loaded into the lever action as a single shot, by passing the loading gate on the side of the receiver, but might not eject if the cartridge was chambered but not fired. It is of at least historical interest to note that Winchester (W.R.A. Co.) manufactured ammunition for the .45-70 Marlin and Winchester lever-action repeating rifles as well as for Sharps and Springfield single shots. It was also essential for the wholesale or retail outfit to know what ammunition to order for its customers.

Cartridges available at the introduction of the Winchester Model 86 included the .45-70, .45-90 and .40-82 WCFs. The .40-65, .38-56 and .50-110 Express were added the following year. The .40-70 and .38-70 were added in 1894 with the addition of the .50-100-450 in 1895 and the .33 WCF in 1902.

The .40-82, .40-70, .40-65, .38-70, .38-56 and .50-100-450 were discontinued in 1910, followed by the .45-70, .45-90 and .50-110 in 1919. The .45-70 returned in 1928 and was discontinued again in 1931, about the time the Model 86 faded out after a total run of approximately 159,994.

Winchester routinely held parts in bins, ready for assembly, but did not necessarily use parts in numerical order. As such, a serial



Left to right: (1) Model 86 .33 WCF Extra Light Weight; (2) .33 WCF Light Weight; (3) .40-82 WCF, circa 1917; (4) .50 EX, circa 1891; (5) .40-65 WCF, circa 1892; (6)* USRAC .475 Turnbull; (7)* .45-90 WCF Miroku/Turnbull; (8) .45-70 Browning carbine; and (9) .45-90 WCF Extra Light Weight. * Turnbull Restorations

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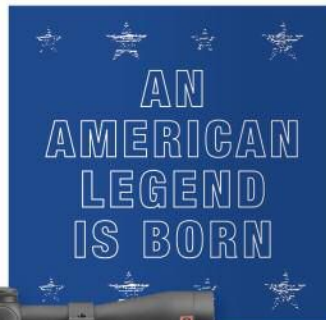
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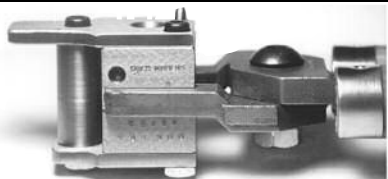
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number of the rifle might indicate the rifle was made and shipped in a given year, but it was actually assembled and shipped at a later date, often years later.

In addition, where a cartridge may have been discontinued in 1910, the serial number might indicate the rifle was shipped some time after that date. So, it is possible, for example, to find a .40-82 that by its serial number would indicate it was made in 1917, seven years after that cartridge was discontinued, but a rifle may have been made up with a .40-82 barrel that was still in stock. Regardless of the serial number on all Winchester lever-action rifles, the year it was shipped is stamped on the rear of the barrel, near the receiver, under the forearm. For the Model 1886, the last sales record is dated in 1936.

With the introduction of the .33 WCF in 1902 also came the development of Winchester High Velocity (WHV) in the .45-70, .45-90 and .50 Express, the latter two of which developed roughly 2,200 fps with 300-grain jacketed bullets. Pressures were equal to the .33 WCF, running 40,000 CUP. But owing unqualified jabber over the years, and the large number of Model 1886 rifles made prior to 1902, the Model 86 was considered to be weaker than the modern Marlin Model 95. As a rule, rifles made for WHV smokeless loads post-1902 are stamped "Nickel steel for smokeless powder," although George Madis in *The Winchester Book* suggests not all smokeless barrels were so marked, in particular, octagonal barrels.

There were also two relatively unknown cartridges, the .31-62 and .46 WCFs, that never advanced beyond experimental stages, circa 1891 and 1910-12, respectively. Drawings for the .31-62 WCF indicate it was based on the .45-70 case and is generally considered by cartridge historians to be the first



The USRAC/Turnbull .475 Turnbull took this bull hippo with a broadside ear shot at 90+ yards.

smokeless powder sporting cartridge developed in the U.S. and likely led to the development of the Model 94 Winchester and the .30 WCF specifically for smokeless powder. The .31-62 drawing resembles the .33 WCF, although it predated nickel steel barrels by a few years.

The .46 WCF is based on the 2.4-inch .50 WCF case. According to Winchester's notes in Dan Shuey's two-volume set *W.R.A. Co. Headstamped Cartridges and Their Variations*, the .46 WCF proof load developed 65,940 CUP, and the standard load with a 360-grain jacketed bullet reached 2,362 fps (4,960 foot-pounds), likely in a 26-inch barrel.

At its introduction, the Model 1886 featured a 26-inch octagonal barrel and full-length magazine tube. Weight averaged about 8 pounds, 12 ounces. By serial number 100,000, the lightweight rifles featured 24-inch tapered barrels, and the front receiver ring was reduced by approximately $\frac{1}{32}$ inch. The fore-

arm cap was reduced in depth by about ¼ inch to accommodate a trimmer forearm, and the buttstock was replaced with a somewhat lighter design, with a smaller crescent steel buttplate, or shotgun butt, the latter of which was considered standard. The standard Extra Light Weight rifles with 22-inch barrels averaged 6 pounds, 12 ounces. A takedown Extra Light Weight ran about 7 pounds, 4 ounces, slightly less than a standard carbine that weighed in at 7 pounds, 12 ounces. Oddly, given the reduction in weight and the improved handling characteristics of the Model 1886, circa 1900, the 1886 still carries a reputation for being a big, heavy rifle – no doubt abetted somewhat by the current lightweight made in Japan (Miroku) for the current owner of the Winchester franchise, Fabrique Nationale – that features a heavier buttstock, forearm and crescent buttplate, along with a rather heavy 22-inch .45-70 barrel and half-magazine. It's a bit lighter than the

standard full-sized sporting rifle made by USRAC and Browning, but its balance and weight hardly match up to the original post-1900 Winchesters.

As a rule, Winchester was quite specific regarding the bullet weight and powder charge for all the cartridges chambered in the Model 86. The .40-82 and .40-70 were great examples, being loaded with 262- and 300-grain bullets, respectively, with different twist rates. The difference in the 2.4-inch cases was simply neck length.

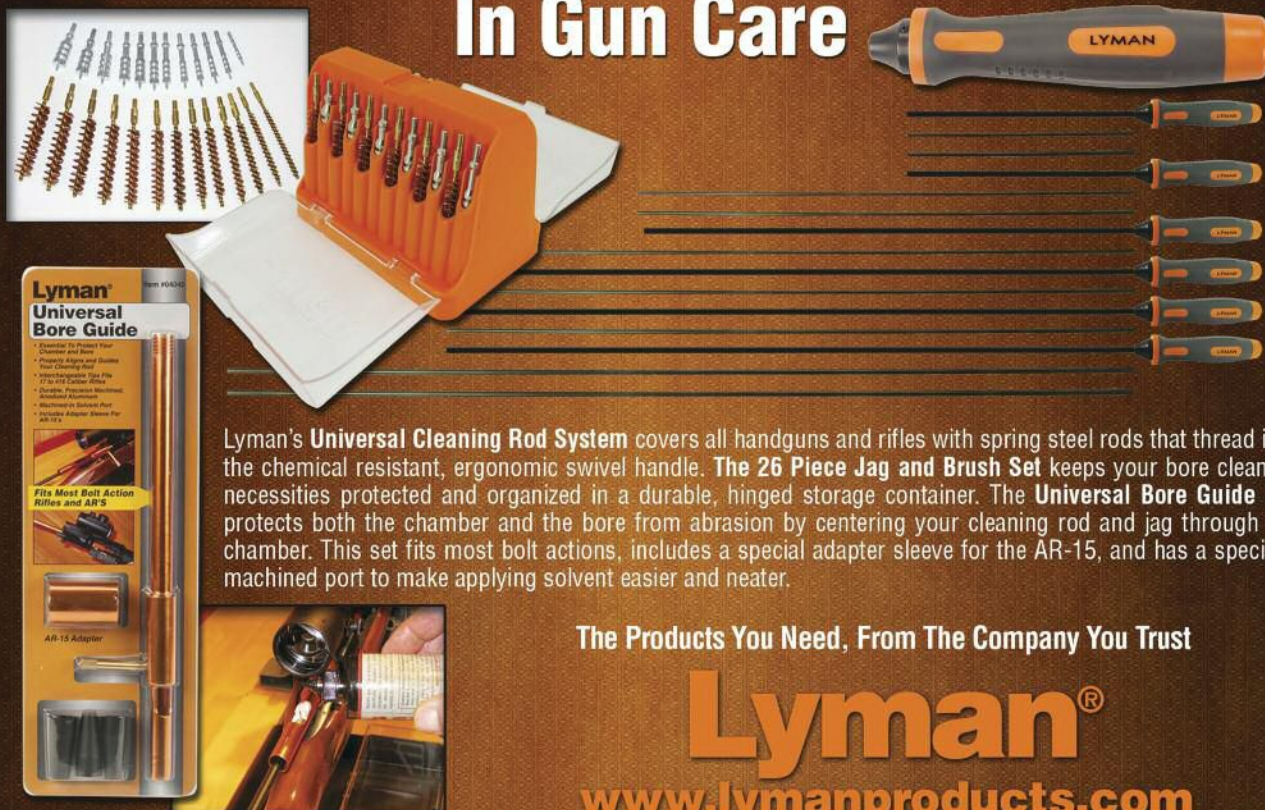
The curious exception was the .45-90 2.4-inch case that was loaded with 300- and 350-grain bullets over 85 grains of black powder but were intended for use in the .45-90 WCF, which was standard with a one-in-32-inch twist for the lighter bullet. No doubt, the 350-grain bullet would shoot with reasonable accuracy in the slow twist, but the sights on a .45-90 rifle are regulated for the 300-grain bullet. Curious indeed, since Winchester was

adamant about matching the sights, twist and bullet weight in all its lever-action rifles/cartridges.

The only other exception to this apparently unwritten rule regarding powder charge, bullet weight and twist rate was the .45-70 WHV with a 300-grain jacketed bullet that shot upward of 8 to 10 inches higher at 100 yards using sights regulated for a 400-grain bullet at the same range. The real problem is the sights, which cannot be regulated for both bullet weights without changing to a taller front sight to accommodate the lighter bullet. This probably explains the popularity of receiver or tang sights on smokeless rifles, which in either case requires the removal of the rear barrel sight so it won't block the line of sight. The sight problems become even more troublesome when switching from smokeless to black powder, or vice versa, where black-powder loads require a somewhat shorter

(Continued on page 66)

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BETTER SHOOTING WITH APERTURE SIGHTS

MOSTLY LONG GUNS by Brian Pearce

A letter was recently received from a government trapper in Nevada who hunts about “300 days a year,” taking a variety of problem animals. Included are around 50 mountain lion annually. He has been doing this for 41 years, his experience is extensive, and he might best be described as the “real deal.” This region of Nevada is high elevation, windy, cold

ried in a saddle scabbard, along with harsh use and exposure.

Most shooters and hunters cannot relate to the demands placed on equipment that gets worked in the field 300 days a year by a professional, often under poor conditions and with minimal maintenance, but it must work on demand or valuable dogs can be killed, or worse. A gunsmith, or the tools necessary to make repairs or adjustments, may be days away and are generally not readily available.



A variety of front sight options are available to accommodate different eyesight needs and hunting circumstances.

and has rugged terrain, so he often rides a horse while pursuing lion with hounds. For years he used a Marlin Model 1895 .45-70 but has now switched to a Marlin Model 1894 .357 Magnum to prevent “scaring” the dogs, and it has proven reliable on lion and other game. All the blue finish is completely worn off from being car-



Large “ghost ring” apertures (left; .230 inch) are generally preferred for hunting game in the timber, while smaller apertures (right; .096 inch) are at their best for target work and in normal light conditions.

Many modern “sporting” rifles, with intricate designs and tiny parts, often fail under similar cir-



Williams Gun Sight Company offers receiver-mounted aperture sights that are fully adjustable for windage and elevation.

cumstances, rendering them useless. The fact that Marlin lever-action rifles can take years of use and abuse speaks highly of their reliability and design, but I digress.

There are several lessons in the above story. As much as most of us enjoy today’s outstanding optical sights for hunting, they are large and impractical when used from a horse 300 days a year, as well as many other applications. Lever-action carbines are flat, short, lightweight, sleek and fast handling, and to retain all those virtues they are best when equipped with quality open or aperture sights, which also correspond best with their stock dimensions. Hunters with outstanding eyes can generally shoot factory-issued open sights accurately, but sooner or later, everyone’s eyes will begin to change, which can make it diffi-

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cult to get a sharp sight picture with both front and rear sights.

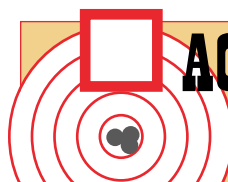
This brings us to the subject of aperture sights, which can produce excellent accuracy, and even “young” eyes will shoot tighter groups with an aperture under all light conditions when compared to open sights. There is no parallax, they don’t fog, they are lightweight and cost is modest. Target acquisition can be extremely fast. The sun position has little effect on sight picture or bullet impact. When used with correctly corresponding targets, sub-MOA accuracy is common (at least if the shooter and gun are capable). If in doubt, consider the accuracy obtained in many different styles of target competitions.

Our government trapper continues: “A couple of years ago, my eyes weren’t picking up that rear sight like they used to. I put on a

Skinner Sight, and I am driving tacks again. . .” Later, he specified that he was using an aperture measuring .155 inch, the largest Skinner Sights offers. This is a similar conclusion that nearly all old-time hunters (except long-range buffalo hunters) and gun writers came to. For example, Elmer Keith suggested aperture holes (for sights mounted on the receiver and not the tang) to measure from .150 inch and even up to .200 inch for general field shooting that requires accurate shot placement, while allowing quick acquisition on moving game in brush and timber.

The modern receiver hunting sight has evolved, with several companies offering advanced versions that are tough, simple and will withstand harsh field use. Lyman Products and Williams Gun Sight offer traditional receiver side-mount versions, while X-S and Skinner Sights offer top-mount varieties that are especially simple, fully adjustable and constructed of tough machine steel.

Like our government trapper, I have been using Skinner sights on several rifles the last few years and have been very pleased with their performance. The top-mount design, being supported by the receiver, is especially strong and does not interfere with the flat profile or sleek lines of leverguns. For those who want extreme durability, a winged version is also available. Generally, I prefer the standard version, as it offers maximum visibility on each side of the aperture. The simplicity of either design results in virtually no problems when subjected to continual use and abuse.



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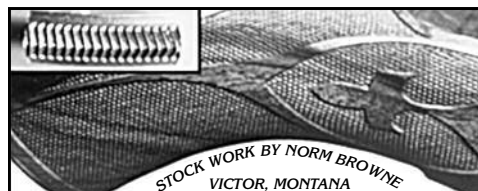
There is no perfect “one size fits all” aperture for every situation, so Skinner offers interchangeable apertures measuring .040, .070, .096 (the size shipped with all sights), .125 and .155 inch that will fill the bill for any practical hunting situation. When the aperture is removed, there is a .200-inch ghost ring that is excellent for low-light conditions. I carry two spare apertures in a small container in my pocket (along with my ear plugs), with the primary size being the .155-inch version for general use. When more precise shooting is necessary, such as on varmints, a smaller aperture can be installed in seconds. If hunting big game in poor light, then the aperture is removed and the .200-inch ghost ring is put to work.

Front-sight options are many with the most common being a gold or white bead, fiber optic of various colors or square Patridge style. Every shooter must determine what works best for him or for a given situation. I generally prefer a .074- to .080-inch wide square serrated black (Skinner) or white strip (X-S) for general use, with the latter being preferred when hunting in dark timber. These are modified Patridge designs, also known as “Sourdough Patridge,” as they are forward tapered to reduce snagging. Either sight will allow very precise shot placement yet is easy to pick up (or see) when fast shots must be taken.

For those who may have been deprived the privilege of using aperture sights in their youth, a couple of basic suggestions might help with success. These comments apply to field sights and not competition target versions with aperture-style front sights. Always focus on the front sight and keep the target visible. For example, if using a square, post-style front, place the target in the center of the front sight “flat” and on top. The eye will naturally center the top of the front sight in the middle of the rear sight aperture. When practicing or sighting in, use a

paper target that corresponds with the front sight. Round targets often work well with bead front sights, while diamond shaped versions work with both square Pa-

tridge or bead front sights. Choose a color that offers the best contrast with your sights and eyes. Practice until confidence comes, which won’t take long. 



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K43 (AKA, G43 8x57MM)

DOWN RANGE by Mike Venturino

Elsewhere in this issue in an article about Germany's main World War II battle rifle – the K98k – I posed a question: “Why did Germany adopt a bolt action for its military services when it had to know that America and the Soviet Union were in the process of developing semiautomatic battle rifles?” It's a logical question. My primary answer is that the Wehrmacht was concerned with *Blitzkrieg* or “lightning war.” Its focus was on armor and ground attack aircraft with infantry merely mopping up after the enemy was, for all practical purposes, defeated.

Ground combat in Russia taught the Germans their mistake, however, and by 1941 Germany was



The G43/K43 had a 22-inch barrel, weighed 10 pounds and was fed by a detachable box magazine holding 10 rounds. Standard sights were open rear and post-type front, but all receivers were machined for scope mounting.

scrambling to come up with suitable semiautomatic rifles. In fact, German armament officials put the well-established firms of Mauser and Walther in competition to develop an autoloading infantry rifle. Then they gave them a stipulation preventing them from doing precisely that in the most efficient manner. Both firms were instructed

that no ports could be drilled into the rifles' barrels in order to bleed off gas for operating their mechanisms.

The only solution was essentially the same as that which America's Springfield Armory had done in developing John C. Garand's famous M1. That was to put an appendage at the muzzle to return gas back into the rifle to operate the action. With M1 Garands, this was called the “gas-trap” version. By 1940 the U.S. Army recognized this was a less-than-stellar way to operate a semiautomatic rifle and allowed the M1's redesign with a port in the barrel. Conversely, Ger-



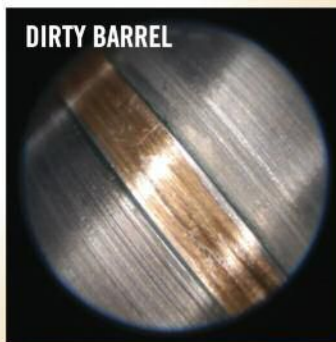
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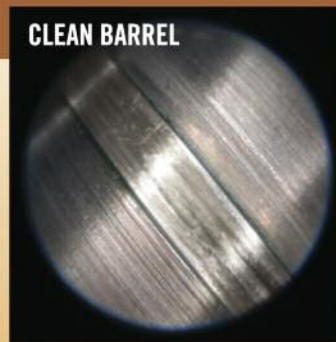
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Germany fielded two other semiautomatic infantry rifles before finally settling on the G43/K43. At left is a G41 (W) and at right is a G41(M).

many got its G41(M) and G41(W) deeply into combat on the Eastern Front before admitting they were mistakes. (The *M* and *W* stood for Mauser and Walther.)

German *Landsers* disliked both M41s. They were muzzle-heavy and weighed about 11 to 11.5 pounds. However, the Walther version gave better service, so that company was pushed to bring out a redesigned semiautomatic. Mauser was excused from the project to focus on K98k production.

Under wartime duress, Walther's engineers were finally given the



By its markings and serial number, this K43 was made in the last three months of World War II.

okay to port their barrels, in fact copying the Soviet Union's SVT40 gas system. As finally developed and issued, the new G43 had a 22-inch barrel, 10-round detachable magazine, laminated stock, and all receivers were machined with an integral rail for mounting telescopic sights. Weight decreased to approximately 10 pounds. Interestingly, no provision for bayonet mounting was made. Naturally, the 8x57mm (aka 7.92x57mm and 7.9x57mm) chambering was retained.

Unlike the U.S. M1 Garand, with its port and gas system beneath the barrel, Walther redesigned its new rifle to have it on top of the barrel. This system gave one obvious advantage over the Garand in that only the handguard had to be removed for cleaning. With the M1, the entire barreled action had to be dismounted from the stock for cleaning.

The German military adopted the new semiautomatic as of April 30, 1943, and gave it the designation G43. The *G* stands for *Gewehr* (rifle). Initial, full-scale production was handled by Walther, but it alone could not meet the nation's needs. Therefore Gustoff-Werke of Weimar and Berlin-Lubecker Maschinenfabrik of Lubeck (BLM) tooled up for G43 production. In April 1944, the rifle's name was changed to K43, with the *K* standing for *Karabiner* (short rifle). No changes were made to the rifle.

Although I have never seen an early G43 by Walther, the book *Hitler's Garands* by W. Darrin Weaver has information that they rivaled then-produced K98ks in production quality. That cannot be said for those made later. Due to wartime duress, orders came down from above directing manufacturers to cease any cosmetic machine operations. That alone reduced machine time by a couple of hours per receiver. A phosphate finish was applied to the rough forgings after necessary machine operations were complete.

As my shooting collection of World War II firearms grew, the

(Continued on page 67)



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.17 HORNET

CLASSIC CARTRIDGES by John Haviland

Seventeen-caliber cartridges have had a long, intermittent relationship with American rifle shooters. The .17 Hornet is one of the oldest .17 cartridges but became one of the newest when Hornady introduced its version of the .17 Hornet in 2012. It's too early to tell whether its legitimacy as a factory cartridge will help the .17 Hornet win its uphill battle for acceptance. Unfortunately, a couple of other good .17-caliber center-fire cartridges have failed to do so.

Experimenter and barrel maker P.O. Ackley led the way with .17-caliber cartridges during the years following World War II. His first was the .17 Pee Wee based on the .30 Carbine case. It was followed

by the .17 Hornet, .17 Bee and .17/222.

Hornady's .17 Hornet case, though, is a bit shorter in length and with less taper to the body. The shorter case allows loading Hornady's relatively long 20- and 25-grain V-MAX bullets, while retaining the same 1.723-inch overall cartridge length of the .22 Hornet, so the cartridge fits in existing magazines and bolt actions originally intended for the .22 Hornet, like the CZ 527, Ruger 77/17 Hornet and Savage Model 25.

Hornady is the only company selling .17 Hornet ammunition. The Superformance loads include a 15.5-grain NTX bullet with an advertised muzzle velocity of 3,870 fps and a 20-grain V-MAX at 3,650 fps. The V-MAX bullets in the Superformance loads had an average velocity of 3,567 fps for 10 shots measured 10 feet in front of the muzzle of the 21.90-inch barrel of a CZ 527 American.

The little rifle and Hornady's V-MAX Varmint loads were accurate too. Five, five-shot groups measured an average of .89 inch at 100 yards. Two, five-shot groups averaged 2.47 inches at 200 yards and 3.46 inches at 300 yards. With the rifle sighted to place bullets 1.40 inches high of aim at 100 yards, they hit an inch above aim at 200 yards and dropped 5.50 inches at 300 yards. The V-MAX bullets are packing 188 foot-pounds (ft-lbs) of energy at 300 yards. That's still nearly a third more energy than a 38-grain .22 LR bullet has

at the muzzle. So with that trajectory and clout, the .17 Hornet is an honest 300-yard ground squirrel and marmot cartridge. That performance costs about \$1 a shot.

Handloading greatly reduces the expense of shooting the .17 Hornet. Because it burns a miserly 9 to 13 grains of powder, .17s can be handloaded for about 30¢ per shot if the cost of cases is spread over 10 reloads. That's approaching the price of .17 Hornady Magnum Rimfire shells.

Only one of my handloads with the 20-grain V-MAX beat the Su-

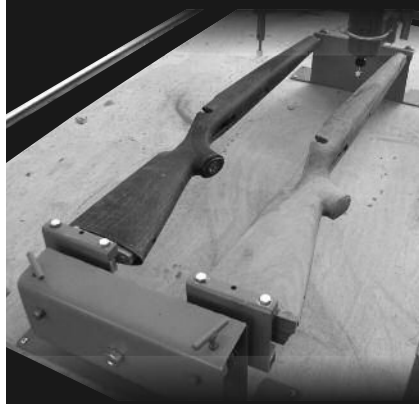
performance velocity, but accuracy was not nearly as good. The velocity of heavier bullets dropped nearly



Above, the .17 Fireball (left) should have become a fairly popular cartridge. How has it not sold well? Perhaps small-game hunters are content with the .17 HMR (right) and its lower cost. Right, the .17 Hornet.



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The .204 Ruger (center) replaced the popularity of small-caliber cartridges like the .17 Hornet (left). In recent years, the .223 Remington (right) has drawn a lot of shooters away from the .204.

500 fps. The fastest my handloads fired Hornady 25-grain V-MAX bullets was 3,136 fps from 11.0 grains of H-4198.

The .17 Hornet's limited case capacity means velocities change significantly with a minor increase in powder weight. Hodgdon's load data shows 11.0 grains of H-4198 gave 20-grain V-MAX bullets a velocity of 3,226 fps. An additional 0.8 grain of the powder increased velocity by 237 fps. One of my handloads with 9.5 grains of Lil'Gun gave the 20-grain V-MAX 3,500 fps. An additional 0.5 grain of Lil'Gun increased the velocity

Table I

.17 Hornet Factory Loads

load (grains)	muzzle	yards				
		100	200	300	400	500
15.5 Hornady Superformance NTX						
velocity (fps):	3,870	2,940	2,178	1,550	1,120	927
energy (ft-lbs):	515	297	163	83	43	30
trajectory (inches)		+1.3	0	-9.0	-33	-84.5
20.0 Hornady Superformance V-MAX						
velocity (fps):	3,650	3,078	2,574	2,122	1,721	1,283
energy (ft-lbs):	592	421	294	200	131	85
trajectory (inches)		+1.10	0	-6.40	-20.80	46.80

Table II

Select .17 Hornet Handloads

bullet (grains)	powder	charge (grains)	velocity (fps)
20 Hornady V-MAX	H-4198	11.5	3,358
	Lil'Gun	10.0	3,698
25 Hornady V-MAX	H-322	12.5	3,063
	H-4198	11.0	3,136

Be Alert - Publisher cannot accept responsibility for errors in published load data.

198 fps, exceeding the Superformance velocity.

Light, 20-grain bullets also produced wide swings in velocity with most powders. Extreme velocity spreads ranged from 104 fps to 368 fps with IMR-4227, 142 fps with Reloder 7 and 162 fps with H-4198. Lil'Gun was the most constant, with extreme spreads ranging from 45 to 69 fps. Heavier 25-grain bullets had much lower extreme spreads of about 45 fps.

For years Cooper Firearms has been a steadfast supporter of small-caliber cartridges, chambering its Model 38 single shot for all

manner of .17-caliber cartridges, including the Squirrel, Ackley Hornet, Fireball, Hee Bee and Cooper Centerfire Magnum. However, Mike Hudgins, Cooper's manufacturing manager, said the popularity of these cartridges has faded in recent years. When the

.204 Ruger came out in 2004, it was quite popular and snared any remaining popularity of the small-caliber cartridges. "But now the .204's popularity has started to fade due to the ever-increasing interest in the .223," he said.

Every year RCBS ranks the top 25 centerfire cartridges based on its reloading die sales. Not a single .17-caliber cartridge made the list in 2013. The .204 Ruger placed 22nd in 2013, down from 19th in 2012. The .223 Remington sat at No. 1 in 2012 and 2013 and is not likely to give up that spot in the foreseeable future.

The .223 Remington accounted for 16.7 percent of rifle ammunition sales in 2013, according to a report by the National Shooting Sports Foundation. The .204 Ruger was way down the list with 0.4 percent of rifle ammunition sales, the same as the ancient .35 Remington. The .17 HMR was the only .17-caliber cartridge of 35 cartridges mentioned. It garnered 2.4 percent of rifle ammunition sales, the same as the 7mm Remington Magnum.

If any .17-caliber centerfire cartridge should be on that list, it

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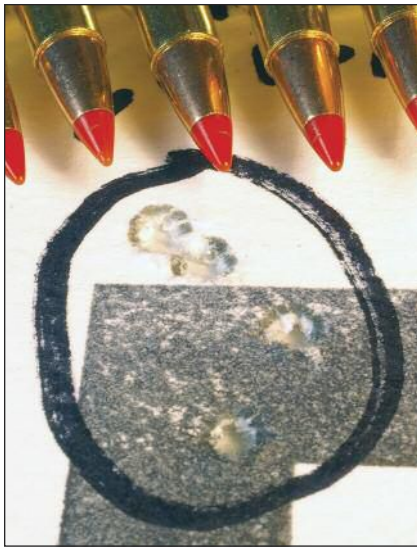
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Hornady .17 Hornet cartridges shot great from a CZ 527 rifle.

ought to be the .17 Remington Fireball. The Fireball has no aggravating case rim like the Hornet, and loaded with six additional grains of powder, it shoots 25-grain bullets 500 fps faster than the .17 Hornet. But the Fireball gathered such a trivial following since its introduction in 2008 that Remington discontinued chambering rifles for the cartridge a couple of years ago.

Perhaps most small game and varmint hunters are content with their .17 rimfires. The .17 HMR costs about 5¢ less per shot than handloaded .17 Hornets. When Winchester Ammunition came out with its .17 Winchester Super Magnum rimfire in 2013, it stated the cartridge offered hunters the performance of a centerfire cartridge at the more affordable price point of traditional rimfire ammunition. That was true at first, with .17 WSM shells costing slightly over 30¢ apiece. But a run on rimfire cartridges well into its second year has created a shortage of .17 WSM and .17 HMR shells. At www.gunbroker.com, scalpers are attempting to sell .17 WSM cartridges for about 60¢ per round.

That does not worry .17 Hornet handloaders. A few boxes of bullets and a pound of Lil'Gun powder will last for several summers of inexpensive shooting. R

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PROJECTS!

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Replacing broken parts, modifications and stock work are all part of the fun for those fascinated by firearm mechanisms and wanting to learn more. Keep in mind, however, it's necessary to go slowly. Often gun designs don't appear rational, especially when it comes to disassembly. There are even a few that can be compared to the silly TV ads that run a disclaimer stating "controlled environment, participants are professionals/actors, do not try this at home!" Gunsmithing books from the NRA or Brownells are a big help here.

always done – we find *projects*! These come in four categories: (1) rifles having broken or missing metal parts or stocks, (2) military or sporting rifles altered to the point they no longer have collector value, (3) rifles chambered for wildcat cartridges being sold without reloading dies, and (4) rifles built or modified to serve no known purpose – imagine that!



The receiver has more holes than Swiss cheese, and these must be filled. Also note the drooping lever.

The common denominator in all these categories is a low purchase price. The cheaper the gun, the better the project! Such arms are commonly sold for about half what a complete functioning/useful rifle would bring. Often they can be purchased for far less. Since each project is different, each requires

learning new things and developing new skills. Also, projects are a way for amateur gun tinkerers to be able to fiddle with rifles they could never afford at current prices.

The earliest project in my memory is a category two. I was maybe 12 when Dad brought home an old military rifle. The stock was broken and useless, sights gone, and there was a big rectangular hole in the wood below the ejection port where Dad said a magazine belonged.

From then on every gun show we went to found us looking for parts for "the Krag project." In about a year the rifle was complete, and we went to the range one Saturday to fire it for the first time.



What is called a "wedding band" is used to separate the octagonal section of the barrel from the round. (Holes are from a former scope block.)

Yet what do we do when none of our guns need work? Simply the same thing serious riflefolk have



Cutting a groove in the barrel for a GROVTEC barrel band.

After setting up, the only other fellow on the range walked over and remarked, "You know, Rudy, you should let the boy fire that rifle first, then if it blows up we won't kill a productive member of society."

Immediately Dad allowed as how that was a good idea and loaded one round into the sandbagged rifle. The previous comments caused a



A GROVTEC band is clamped in the groove. No slipping here!



Octagonal flats ahead of the forearm. The barrel is round under the wood only, making for an easier fit.

bit of hesitation on my part – but it didn't last long. Dad said to hold on a broken concrete block sitting at one end of the dirt back-stop. At the shot the target disappeared in a puff of concrete dust. Neat! It never occurred to me to question how that supposedly *first* shot could have been dead on. I've been looking for projects ever since.

The rifle shown here is an example of a category four project. It's a BSA Martini that began life in England as a .22 rimfire target rifle sometime prior to World War II. I know this will cause howls of anguish in some quarters. Martini! Yuck! Yuck times 10! Many folks simply hate them, insisting the rifles are clumsy and actions look like paving bricks with the corners broken off. Others see classic beauty. Regardless, they are often examples of less-than-skillful modification, thus they are priced right and make good projects.

This Martini is typical. Of the original rifle, only the action remains. It was altered to centerfire and used to build a varmint rifle, probably in the 1930s. The buttstock is a nice piece of walnut having the very tight pistol grip common to such rifles. Its buttplate is plastic, required refitting and isn't original to the replacement stock. The crowning touch was a sling loop that swiveled easily, but when aligned with the axis of the rifle it fell out! This thing would release about the second time it was used. Judging from the replaced buttplate and dents in



The swivel bow is held to the stock by turning it 180 degrees (arrow). There is no lock.

the stock, that is exactly what it did! It was necessary to plug the hole, then install a swivel stud through the opening in the oval base plate of the original gadget.

Of course, the opening lever had been bent to fit the pistol grip. It flopped down a bit when the striker wasn't cocked; this is common to Martinis and must be corrected. There are many ways to do this. When the British gun trade made high-grade rook rifles on these actions, the lever was often extended and looped under the grip as shown in the photo. A spring-driven plunger inlet into the stock and entering a notch on



The swivel hole was plugged and a standard swivel stud was installed through the original oval plate. It won't come out now!

the end of the lever then holds everything tightly. Forming this loop extension is shown, and welding is easy using TIG or oxyacetylene. Nothing is critical, nothing to fit, the end of the loop just needs to be long enough to engage the plunger. This is a classy modification for any small Martini having a pistol-grip stock.

The receiver had holes for a BSA sight, some type of side-mounted receiver sight and a takedown screw that wasn't needed, because the new barrel was fitted tightly. None were standard 6x48s, so all plugs had to be made.

Next was the barrel. As originally



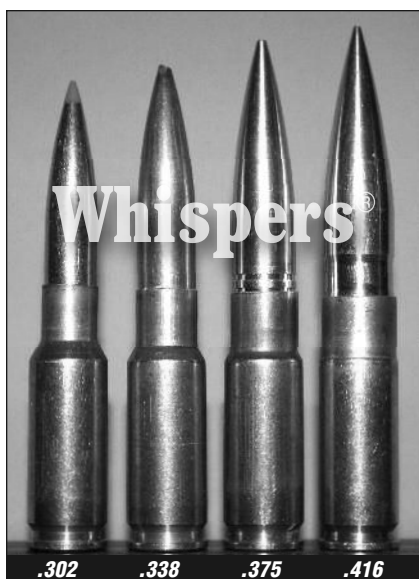
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Bend steel over a pipe to form the circular part of the new lever.

replaced to make the varmint rifle, it was *probably* 26 inches long. It was definitely heavy, with no taper and diameter larger than the receiver width. Length is now 23½



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inches, being rebored and chambered to .357 Magnum. A one-piece steel base taking Weaver rings sits just forward of the action. Holes for target scope blocks remain.

Then there was the forearm. It was crudely made, lined with epoxy bedding and loosely held to the barrel by two screws taken from (this is no joke) the cover plates of wall-mounted light switches. This had to go away!

The barrel was turned down, the rear portion milled octagonal where not covered by the new forearm. A "wedding band" transitions octagonal to round that then tapers rapidly to the muzzle. The smaller forearm required a barrel-band, sling-swivel stud. A two-piece band from GROVTEC (sold by Brownells and MidwayUSA) was clamped in a .010-inch deep groove turned in the barrel. This prevents slippage on rapidly tapered barrels. GROVTEC also offers one-piece split bands for smaller diameter barrels. Quality is superior, and they are American made.

The Martini now weighs well over a pound less and is much better balanced. It is an example of a perfect project in that most every aspect of gun work was employed. It may still be a category four rifle, but it was fun to do. Accuracy with cast bullets is excellent.

Now it's on to the next project. I can't decide if it will be the Winchester 1906 that appears to have been lovingly stored in a



A simple spring plunger and a notch in the lever keep the lever tight.

barn for the past 100 years or a recently acquired 6.5x53R sporterized Dutch military rifle. The latter has a maple stock (I hate maple!) that is so ugly that if the tree had known it would end up like this, it would surely have withered and died in its first year. Besides having been checkered with a farrier's rasp, the entire buttstock is covered by a carving that *could* represent a deer. It could also be an antelope, horned grizzly or mythical beast. I have been wanting to remove this insult to wood work ever since the rifle was purchased. As I write this, there is a fine fire burning in the fireplace – perhaps the decision has been made for me!



The rifle is complete, except for the bluing.



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LAPPING STEEL SCOPE RINGS

A RIFLEMAN'S OPTICS by Lee J. Hoots

There are several good reasons to lap scope rings. Doing so helps remove aberrations in ring concentricity and wears off sharp edges or burrs that may otherwise go unnoticed and can ultimately kink or dent a scope tube. Top-end, expensive scopes are made to fine tolerances of thin, but strong, lightweight alloys; the same cannot be said for some scope rings.

Lapping also can be used to remove rust, and it creates more surface area on which the rings can grip the scope tube, thus requiring less torque on the screws that hold rings together. Lastly, like handloading, the chore of manipulating rings to better fit a favorite scope on a trusted rifle in itself can be a worthwhile endeavor for shooters who enjoy tinkering.

Lapping is largely unnecessary with rings made of aluminum, or when using high-quality steel rings that clasp together at the top center of the scope, such as those made by Talley Manufacturing. By design, such rings flex and conform to the scope's contour to provide plenty of solid purchase, holding steadfastly even large,



Ruger's steel rings often can benefit from lapping, as they are not concentrically adjustable. Lapping has removed the surface from about 40 percent of these rings.

heavy scopes mounted to rifles in the hardest-recoiling cartridges. They are also less likely to dent a scope so long as the ring manufacturer's torque standards are applied to screws.

age a scope's finish or compress the scope tube even when screws are tightened to manufacturer specifications. They represent the only design I have bothered to lap, and include most "Redfield-type,"



Lapping kits come with alignment bars, like these from Weaver. Longer after-market bars are preferred by some shooters, but two-piece bars work well.

Commonly used, strong, two-piece rings cast or machined of steel that include bottom and top halves, at least in my experience, are the most likely to mar or dam-

two-piece rings. Ruger's similar, stout rings can also benefit from lapping, especially since they are not concentrically adjustable.

That's not to say these ring styles are poorly made. In fact, they are among the strongest on the market. Yet often enough – having mounted a scope and then shooting, only to find that a slight change in eye relief would be beneficial – loosening the rings to slide a scope forward or rearward or to move it from one rifle to another has revealed unsightly scarring to the surface of expensive optical equipment. In the worst case, scopes have been dented, usually on the sides where the rings have pressed inward, pinching the scope when tightened.

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The grinding compound will also wear down the lapping bar over time, but the bar will last for many dozens of rifles.



Driving screws tighter than necessary may be the cause, but lapping all rings of this design usually presents a solution. These days it is done as a matter of course, whether on a personal rifle where the scope is not likely to be removed, or when using a sample scope that may end up on several rifles over time before it is returned to the manufacturer.

Lapping steel scope rings is simple and requires a few basic tools that can be purchased separately or in kit form from mail-order outfits like Brownells (www.brownells.com). The one used here is a Weaver Deluxe Scope Mounting Kit. It includes an adjustable torque wrench, thread adhesive for those who prefer to use it, a small assortment of driver bits to fit com-

mon ring and base screws, a lapping bar and scope ring alignment bars. It also contains a one-ounce jar of gritty, gooey lapping compound, enough to properly shape many dozens of ring sets.

A rifle cradle is also necessary but doesn't need to be expensive so long as it holds a rifle securely and doesn't slide around on a tabletop. A barreled action could also be held in a bench vise if suitable padding is used to grip the barrel firmly without damaging it. A couple of pieces of 4- or 5-inch long, V-notched hardwood plank-ing can be used to hold a barreled action, or entire rifle, in a vice.

With base rings (sometimes called saddles) and cap rings mounted to the rifle and aligned with an alignment bar/bars, use a piece of masking tape on each ring to identify "front" and "rear" and "left" and "right," because the ring caps will be removed once or twice during the process. It is important that ring caps be replaced to their



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Just a small dab of grinding compound is all that's needed between cleaning rings while checking progress.

original base in proper orientation if concentricity is to be maintained.

With the caps marked and removed, a small amount of lapping abrasive is added to the rings with a swab, then simply replace the lapping bar and the ring caps appropriately. Snug them just enough to "feel" resistance of the grinding compound when rotating the lap-

ping bar. The best and most even results will be had if the ring caps are eyeballed to remain parallel with the base rings; this doesn't have to be perfect, just close.

Rock the lapping bar side to side and slide it forward and rearward during rotation. When resistance decreases, slightly tightening the rings, evenly, on each side will create more resistance and remove more metal from the bottom and top ring halves. It is prudent to remove the cap rings from time to time and wipe off the lapping compound with denatured alcohol or a similar solvent from both halves to check progress. This is the best way to keep from removing more metal than necessary.

There are varying opinions on how much of the rings' inner surfaces should be removed. This is easily identified when the lapping compound has been wiped clean as the bare, polished steel appears shinier where the lapping has taken place, especially on blued rings. If removing more ring surface is desirable, reapply fresh compound and continue the process. Surprisingly, a good deal of lapping can take place before the difference in surface texture and shine can be noticed on hard Leupold or Ruger rings, for example.

Removing more than 50 percent of the original ring surface is probably a waste of time, with a sufficient amount being 30 to 40 percent. At some point, I suppose enough metal could be removed to weaken rings or allow the scope to fit sloppily when the screws are bottomed out. As with any mechanical process, learning to use a lapping tool on an old set of rings that can be discarded makes good sense. Part of doing a good job is "getting the feel for it," and adjusting the amount of lapping compound used and pressure applied to the ring screws.

When the rings are lapped enough to provide a firm grip to the scope, they then can be removed and rinsed in water. I prefer blasting them with a can of carburetor



Above, the blued ring is fresh from its packaging; the lapped ring (below) will provide more purchase on the scope.



cleaner first, then rinsing them clean with warm water and drying them with a hair dryer. Covering the ejection port on the rifle's receiver top with a rag is also a good idea as lapping compound could conceivably find its way into the bolt races. This should be avoided



This Leupold ring has been lapped and refinished with Birchwood Casey cold bluing.

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Weaver's standard scope lapping kit includes all necessary tools; 30mm alignment and lapping bars can be purchased separately.

or otherwise will have to be rinsed off as an additional cleaning task.

When enough surface has been removed, matte-silver rings can be remounted and the scope attached. If the rings are blued, touching up the newly bare steel with Birchwood Casey Super Blue works well. This is a cold bluing that can be wiped on the exposed metal inside the ring with a cotton swab or rag. Punching a hole in the top of the bluing bottle just large enough for the swab to get through helps keep messes down. A coat of Super Blue dries in less than a minute, and two coats provide good protection against rust. Once the bluing is completely dry, wipe down the rings with a very thin coat of gun oil and mount the scope.

In all honesty, minimal damage inflicted to a scope by over-tightening rings is not likely to hinder its performance. A scope tube would have to be badly crushed before a kink would influence whether its erector components, which allow for vertical and horizontal point-of-impact adjustment, would be impeded. Also, since most scopes attached to hunting rifles never get moved once they're zeroed, dents and scratches under scope rings can remain hidden for years or even generations, with no negative impact. It's nice to know, though, that with a little elbow grease and a few simple tools, a scope can be mounted quite properly with no damage at all. R

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Stan Trzoniec

John Browning was 23 years old when he designed his falling block, single-shot rifle in 1878, and it is still around today in variations from Browning and Winchester. Recently I've taken a liking to the Browning line of Model 1885 rifles, both the Low Wall and High Wall.

According to history, in 1883 Andrew McAusland, then a salesman with Winchester, came across a single-shot rifle that was new to him, as was its maker. The rifle was stamped and made by the Browning

Brothers of Ogden, Utah. McAusland immediately purchased the rifle for \$15 and promptly sent it off to Winchester Arms. It was chambered for the .45-70, a large cartridge for sure and something Winchester didn't have in its present rifle line to handle.

Winchester sent its Vice President and General Manager T.G. Bennett to Ogden on the next train out. Apparently, Winchester was impressed, and even though serial number 463 had been subjected to hard usage, the action was smooth and tight. While not a large quantity of rifles were made, Winchester sensed competition from Browning, and with Mr. Bennett on the way to Utah, it hoped to purchase the rights to the gun, manufacture

New Version of an Old Classic



The Winchester Model 1885 is nicely detailed on both the receiver and stock. The walnut stock is oil finished.

it in New Haven, Connecticut, and eventually distribute the rifle around the country.

In any event, in Ogden a deal was struck for Winchester to manufacture the rifle, and while Bennett was prepared to offer as much as \$20,000 for the single shot, Browning asked only for \$10,000, to which Bennett countered \$8,000! Browning signed off on the

WINCHESTER 1885 Low Wall Single Shot

The breechblock has been left in the white. The cartridge deflector is left or right adjustable to deflect the spent cartridge.

deal, Winchester introduced the rifle in 1885 in four different weights in both a low wall for lighter cartridges and a high-wall version for more powerful cartridges to include the .50-95 Winchester Express. Freed from the daily routine of manufacturing, John Browning could now turn his attention to inventing more guns for hunters worldwide. The relationship between Browning and Winchester would last another 19 years and broke up when Winchester refused to pay Browning a royalty on a new semiautomatic shotgun.

Termed by many as the most famous Winchester in the line, the

With the breechblock in the up position (shown here), the trigger is easily accessed.

Model 1885 was reintroduced last year. Called the Model 1885 Rimfire, it is a variation on a theme brought out by Browning some years back. (We'll detail all that shortly.) Available chamberings include .22 Long Rifle, .22 WMR, .17 HMR and the new .17 WSM. Since I have not used the .22 WMR in quite a while, and it is one of my favorites, it's the cartridge tested here.

Dropping the finger lever allows the breechblock to follow downward. Raising the lever pushes the block up while cocking the hammer.

While the Browning rifle had a fancy, high-grade stock with a glossy, urethane finish, the Winchester is different, but it is similar in stock profile and design features. The stock is profiled from straight-grained walnut with an oil finish that is smooth to the touch. It carries many of the traits found on pioneering models made by Browning in the late 1800s, owing

to its sleek lines that are perfect for field use.

There is a Schnabel tip that is rounded off, formed perfectly for appearance and inletted carefully around the octagonal barrel. It is a little thinner than on previous Model 1885s but has more than enough checkering to satisfy most hunters. There are deeply checkered twin panels on the forearm with a border that adds a bit of a custom touch. Near the receiver, the wood tapers in slightly, being just proud at the leading edge of the Low Wall receiver. Underneath, there are two screws that allow the forearm to be detached. The forearm is attached to a forward facing hanger, so the barrel is free-floated for enhanced accuracy.

Unlike the larger High Wall (aka Model B78) that featured a fuller stock complete with a cheekpiece and higher comb, this Low Wall has a classic-styled stock that is very comfortable to use. Like the forearm, it is walnut with a grain pattern that runs straight and true to the rear, finishing up with a Pachmayr rubber buttpad. Near the receiver, again the wood has been left slightly proud. Except for a small knot on the left side of the stock, I would classify this wood as "select." There are twin flutes on each side for either right- or left-hand shooters. Checkering mimics the forearm with the same point pattern and border, but the sample had a slight bobble of the border near the bottom end of the pistol grip. The grip has a pleasing sweep to it, lending the rifle to be comfortable offhand, on the bench or prone in the field. There is no pistol-grip cap.

Sandwiched between the buttstock and forearm is the trim Low Wall receiver. Polished and blued in the usual Winchester tradition, it is perfectly portioned to the lower end of the cartridge lineup and especially toward the rimfire segment. The width of the receiver is 1.350 inches and is termed a falling-



Left, a one-piece scope base is available for Talley rings. Above, the rear sight is easy to remove, but it's a good idea to hide the dovetail slot with a blank offered at many dealers.

WINCHESTER 1885

block action. All the parts, both internal and external, are machined to exacting standards, and operation is flawless. Outside, the contours of the receiver are held faithful to the original version, and the final fit and finish of the gun is fine. The sides of the receiver show no dips from polishing, and the areas around the falling block, finger lever and deflector are a tribute to modern manufacturing.

Pulling the highly finished finger lever downward lowers the block, dropping the hammer out of the way to load the rifle. Moving the lever back and up returns the falling block to its upright position, and with it the hammer is in a cocked and ready position. (An interesting note found in researching the rifle is that, like Ruger on its No. 1 single shot, Winchester

Specifications: Winchester Model 1885 Rifle

Action: single shot, falling block
Stock: walnut, oil finished
Cartridge tested: .22 Winchester Magnum Rimfire
Cartridges available: .22 LR, .17 HMR, .17 WSM
Barrel length: 24 inches
Overall length: 40 inches
Sights: front and rear sights, receiver drilled and tapped
Weight: 7½ pounds
Finish: polished and blued
Price: \$1,469.99
Manufacturer: Miroku of Japan distributed by Winchester Repeating Arms www.winchesterguns.com

engineers redesigned the Brown-ing falling block and angled the block at 6 degrees to create a more positive breech seal. Bill Ruger did the same thing but only to the tune of 3 degrees.)

Similarly to the original model,

the hammer has a cocked, half-cock and dropped position. There is a trigger adjustment on the bottom of the rifle, and with a little tweaking, I set it at 4¼ pounds of pull with little or no take-up be-



The front sight is from Marble Arms and includes a brass bead.

fore the hammer released. When in the field, it's a good idea to keep the hammer at half-cock, from which it's only a simple matter of pulling the hammer fully to the rear to fire. Thanks to serrations on the hammer that act as a non-slip surface, this is easily done. To the rear of the hammer is a spent case deflector that enables the user to deflect the case to the right, left or straight back.

On the rimfire model, a screw is located on top of the breechblock. According to Winchester, "It is important to clean the firing pin system" at around 1,000 rounds. It's a simple matter to remove the firing pin – loosen this screw, making sure you take care in removing the firing pin to the rear of the rifle while capturing the spring as you remove and clean the firing pin recess. While the instruction book

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Above, the rifle features a Schnabel forend. Right, there is no high comb or cheekpiece on the buttstock. A Pachmayr rubber pad, black spacer and sling swivel studs are standard.



details it fully, there is a certain way to place the pin back into the breechblock, so take the time to become familiar with the installation procedure.

The octagonal barrel is 24 inches long. At the muzzle end, there is a Marble Gold Bead front sight. Closer to the receiver is a semi-buckhorn rear sight fully adjust-

able for fast, close-in action. Because I wanted to mount a scope, I drifted the rear sight out to allow clearance of the front objective lens, and that is the only criticism I had with the rifle. After the sight is removed, there is a rather unsightly gap on the barrel that should be filled with a blank in the dovetail. Sharp-eyed readers may note that the rings have a "W" on

them – Weatherby rings, which were readily available. With the .22 Winchester Magnum Rimfire (WMR) I like the use of a scope, so with the help of the Winchester one-piece base (63502) and a set of Talley rings, a Leupold 2.5-8x 36mm scope was mounted. For appearance sake, both the scope and the receiver are an exact match.

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Range Testing		
load (grains)	velocity (fps)	group (inches)
30 Hornady V-MAX	2,227	.67
40 Remington JHP	1,790	.22
40 Winchester JHP	1,853	1.12

Notes: All groups were five shots fired at 75 yards with the best shown here. All velocities were clocked on an Oehler Model 35P chronograph with an air temperature of 70 degrees Fahrenheit.

The Low Wall operated smoothly, including the ejector, trigger, finger lever and the falling block. I gathered up a bunch of WMR ammunition, sighted in the rifle and was ready for some fun.

The .22 WMR has quite a history.

Right, the finger lever is polished, and there is no pistol-grip cap. Below, the best group was this five-shot example at 75 yards with Remington's 40-grain jacketed hollowpoints.



In some stores, it was not hard to find .22 WMR ammunition, as demand is not the same as for .22 Long Rifle ammunition.

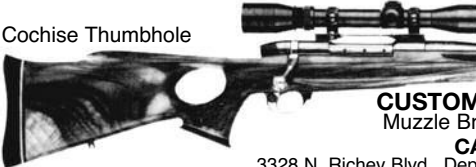


Introduced in 1959, records show that while Winchester waited a full year before chambering it in its Model 61 slide rifle, Smith & Wesson and Ruger had revolvers at the dealers with Savage close behind with its Model 24 rifle. For the most part, it was the only rim-fire cartridge introduced in the twentieth century worthy of success among the ranks of shooters everywhere. I started with one of the fancy Ruger "Super" Single Six Convertibles that included one standard cylinder for the .22 rim-fire cartridges and an extra cylinder for the .22 WMR. Back then, I paid about \$75 for the gun, but now they go for almost \$600 each. Thanks to its mild report and good accuracy, and its ability to keep the same velocity at 100 yards as the .22 Long Rifle has at the muzzle, the .22 WMR is a natural for small game or varmints to include rabbits, prairie dogs, woodchucks, foxes and coyotes at close range.

For testing, Hornady 30-grain V-MAX, Remington 40-grain JHP and the old standby from Winchester, a 40-grain JHP, were used. There was a slight wind from the right at around 6 mph, which did not seem to hamper shooting. The distance was 75 yards, something of a standard for me with the .22 WMR as it is a good distance for ensuring a clean kill on larger woodchucks.

Group sizes shown here are the best I could turn out with each load. The Remington is relatively new in the product line, and if you ask me, one of the best. It consistently turned in five-shot groups that, for the most part, had rounds touching. The Hornady 30-grain V-MAX was a good performer with groups that averaged a bit over .5 inch. The Winchester load shot okay but fell short of the other loads.

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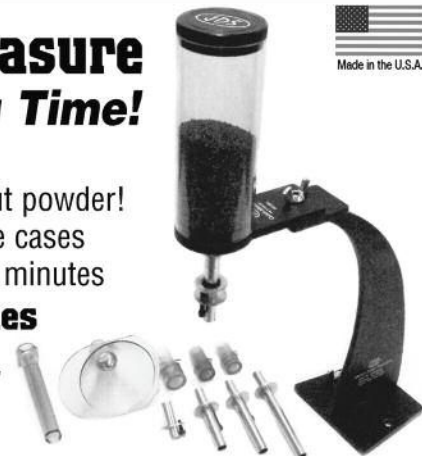
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Invention and

Terry Wieland

At some far, future date, when a professor is teaching a group of budding MBAs the secrets of business longevity, he will find no better example than Steyr, the famous Austrian gun-making company. Steyr could give lessons to the phoenix on rising from the ashes.

Steyr's history, since it was founded in the 1860s, makes one wonder how on earth it ever survived much less prospered to become one of the premier arms-making companies in the world. In an age where business success depends on the "next new thing," and a company like Nokia can go from cutting edge to rubble in a decade, Steyr's ability to innovate, adapt, invent, market and manufacture to the highest standards proves that, regardless of technological change, the old ways still work.

The company that became Steyr as we know it was born in the midst of war in the 1860s, in the Austro-Hungarian Empire, a part of Europe that was becoming increasingly unstable, uncertain and practically ungovernable. Austria-Hungary, as it was generally known, was the shaky remains of a central European empire that traced its roots to Charlemagne in 800

Austria's Steyr – a Serial Phoenix



The Mannlicher-Schönauer Model 1903, the original Steyr bolt-action sporting rifle, in many ways set a standard for design and workmanship in hunting rifles for the next 70 years. The Steyr AUG (left) has been adopted by the military and police of more than a dozen countries, including U.S. Customs and Immigration.

A.D. and which had fought the Turks, the Russians and virtually all its neighbors for a thousand years.

In 1805, Napoleon defeated the Austrian army and abolished the

poster boy for the modern bullpup infantry rifle.

The AUG is just the latest in a long line of successful military and civilian rifles produced by Steyr, stretching back to 1867. It would take several books to list them all and explain their impact, but we can reduce the number to the four most significant: the Werndl single-shot (1867), the M-95 straight pull infantry rifle (1895), the Model 1903 hunting carbine (1903) and the AUG. Each in its way fulfilled Josef Werndl's early admonition

Reinvention

empire. It was resurrected a decade later, after the Battle of Waterloo, and propped up as a buffer against the Turks. Then in 1866, Bismarck's Prussia, seeking dominance of the German states, defeated Austria at the Battle of Königgrätz.

It was one of the few important battles in history where an advantage in infantry weapons played a decisive role. The Prussians were armed with the Dreyse needle gun, an early breechloader; the Austrians carried Lorenz muzzleloaders. The "perfect" Lorenz may have been state of the art, but it was an old art. The new breechloaders were revolutionizing infantry tactics and Austria paid the price.

The defeat at Königgrätz provided the impetus for two men to change Austria's approach to small arms: Josef Werndl and Ferdinand (later Ritter von) Mannlicher.

When today's rifle enthusiasts think "Steyr," they probably think "AUG," and who can blame them? Since its introduction in 1977, the StG 77, or Armee Universale Gewehr, has been the futuristic

that his company should pursue "highest quality and innovation."

Werndl was born into a gunmaking family. His father, Leopold, owned a company that made gun locks. During his apprenticeship, Josef traveled widely, including time in America studying the use of machine tools for mass production. In 1855, he took over the family company and began making extensive changes. After Königgrätz, he undertook to design a new breech-loading cartridge rifle for the Austro-Hungarian army.

Together with Karl Holub, he devised the Werndl single shot, a unique design employing a rotating breechblock and firing an 11.15mm bullet from a centerfire cartridge. Government orders for the rifle put the company on its feet – at least at the beginning.

The long-term problem for Steyr lay in the structure of the Austro-Hungarian state. After Königgrätz, the empire was reorganized into the "dual monarchy." The Emperor, Franz Josef, was Emperor of Austria and King of Hungary. This did not begin to describe his domain,

Invention and Reinvention

however, which included Czechs, Slovaks, Slovenes, Ruthenians, Rumanians, Croatians and a dozen other minorities.

The Czech regions of Bohemia and Moravia were the major industrial areas; Hungary was largely agricultural. Vienna, capital of Austria, was in many ways the cultural capital of Europe, a glittering metropolis that the Turks, in their centuries of trying to capture it, called the “Golden Apple.” Vienna was a center for music (Schubert, Bruckner, Mahler), medicine (Sigmund Freud), philosophy and architecture. Yet it was also, in line with the empire’s many contradictions, the center of a government that was reactionary beyond parody.

Emperor Franz Josef was no fool. He spoke all six of his empire’s official languages fluently and was versed in history and philosophy, but he claimed, to the chagrin of his subjects, to be the “last of the absolute monarchs.” This was not quite true; under the dual monarchy, several regions were semiautonomous with their own legislatures; these bodies voted



Early Mannlicher sporting rifles grew out of the Greek Model 1903 turn-bolt military design. In 1914-18, many were used as sniper rifles, especially in the Alpine fighting on the Italian Front.

funds for such purposes as the army and its equipment.

In spite of being surrounded by potential enemies, all of whom wanted a piece of the shaky empire, money for defense was notoriously short, including funds to purchase rifles. For the first 50 years of its life, Steyr (properly known as ÖWC, or Österreichische Waffenfabriks-Gesellschaft) struggled from one contract to the next. This affected the company profoundly. At various times, it was forced to look for other product lines, leading it into the fields of electrical lighting, bicycle making and, later, automobiles. Such diversification ultimately resulted

in the formation, in 1934, of the famous company Steyr-Daimler-Puch.

Good as the Werndl single-shot rifle was, everyone knew it was only a stop-gap. By the 1870s, cartridge development had progressed to the point where every country in Europe was in a race to develop repeating rifles. In 1886, France adopted the first smokeless powder military cartridge, the 8mm Lebel, setting off yet another round of frantic catch-up by Germany, Britain, Russia and Austria-Hungary.

At Steyr, the young designer Ferdinand Mannlicher was working on several bolt-action designs employing the 11.15mm Werndl car-



Left is a Mannlicher-Schönauer Model 1908, a variation on the '03 chambered for the 8x56 M-S cartridge. Steyr made four variations between 1903 and 1910, each in a different cartridge. After 1920, models were offered with a choice of chamberings. Right, early Mannlicher-Schönauer sporting rifles were noted for their extraordinary quality.



tridge. His mechanisms included both turn-bolt and straight-pull designs, but Mannlicher's early priority was a magazine system to hold cartridges in reserve, in a way in which they could be fed into the chamber readily, and the rifle recharged quickly. Mannlicher developed a method that came to be called the "packet" system. Cartridges were held in a clip similar to what we now call a stripper clip, but instead of being stripped into the magazine, the entire packet was inserted into the action. When the last cartridge was fed out, the empty steel clip dropped out the bottom of the action.

As Mannlicher worked on his designs, Steyr's management searched for markets beyond their home country, just as Mauser was doing in Germany. The two companies (along with Belgium's FN) became the major international small-arms manufacturers in the years from 1890 to 1914. Mannlicher designs were sold to France, Rumania, Greece, Switzerland and Holland, among others.

Steyr's best military design was the M-95 straight-pull rifle, which became Austria-Hungary's standard infantry weapon in the Great War. It was chambered for an 8mm cartridge, employed the packet system and was simple, reliable and fast to use. It was made in both conventional rifle form and also as a carbine for mountain troops and cavalry. In many ways, as a battle rifle, the Mannlicher M-95 was superior to the Mauser 98, which appeared three years later.

The M-95's speed and fire power gave the Austro-Hungarian army a substantial edge – or it would, if they'd had enough of them. The empire's financial constraints restricted purchases of M-95s. When war broke out in 1914, Vienna was reduced to confiscating the arms in Steyr's warehouses, intended for its international customers, and this resulted in Austria-Hungary going to war with a wild variety of infantry weapons.

The Great War ended in 1918 with



The Mannlicher M95 straight-pull rifle was Austria-Hungary's main infantry weapon in the Great War. It remained in use by several countries until the 1930s.

the dissolution of the dual monarchy. Hungary and Czechoslovakia became independent, and Czechoslovakia took with it the great arms-making plant at Skoda, producer of some of Europe's finest field guns, and the rifle factory at Brno.

Austria became an independent country and much of Steyr's equipment and stock was turned over to Italy as war reparations. This did not stop Steyr, however. The company re-equipped with new machinery and continued making its iconic hunting rifle, the

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.38	130 GR. RNFP/500	\$34.00	.38	148 GR. DEWC/500	\$34.50	.44	240 GR. SWC /100	\$32.00
.38-40	180 GR. RNFP/500	\$42.00	.38	158 GR. SWC /500	\$35.00	.44	305 GR. LBT-WFN/100	\$39.00
.44-40	180 GR. RNFP/500	\$42.00	.40	180 GR. RNFP/500	\$41.00	.45LC	260 GR. SWC-HP/100	\$37.00
.45LC	160 GR. RNFP/500	\$44.00	.45ACP	200 GR. SWC /500	\$42.50	.45LC	325 GR. LBT-LWN/100	\$41.00
.45LC	200 GR. RNFP/500	\$44.50	.45ACP	230 GR. RN /500	\$46.00	.458	430 GR. LBT-LWN/100	\$49.00
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Invention and Reinvention

Mannlicher-Schönauer. This rifle, based on Mannlicher's Greek turn-bolt action, had been setting standards for modern hunting rifles since 1903, with additional models and calibers following in 1905, 1908 and 1910.

After 1918, with its civilian hunting rifles imported by Stoeger in the United States, Steyr produced a much wider array in both carbine (*stützen*) and rifle form, in a variety of European and American calibers, and the name Mannlicher became a household word. Among its admirers were Ernest Hemingway and Winston Churchill. Churchill kept a Mannlicher rifle and practiced with it regularly all through the Second World War. Hemingway not only owned a Mannlicher, but he also immortalized it in print – first in *A Farewell to Arms*, then in *The Short Happy Life of Francis Macomber*, and finally in *Islands in the Stream*. The “little Mannlicher,” as the 6.5x54 Model 1903 came to be known, was a “gentleman’s rifle,” always found in the best circles.



Steyr's iconic Automatische Universale Gewehr – the famous AUG – has a futuristic appearance that inspires affection in rifle lovers but dread in anti-gun circles.

In 1934, Steyr and its related businesses merged into the conglomerate Steyr-Daimler-Puch. Its products varied from electrical materials to cars to firearms, but all were characterized by Josef Werndl's “high quality and innovation.”

The next blow came in 1938, with the *Anschluss* – the annexation of Austria by Germany. The Steyr works were converted to

produce small arms for the Wehrmacht, including Mauser 98s. A concentration camp was established near Steyr, and its inmates were used as forced labor. Exactly who was responsible did not matter when, in 1945, the Russians rolled across the border and occupied Austria.

Although Austrians insisted their country was as much a victim of the Nazis as Poland or Czechoslovakia, the Allies did not see it that way. With their usual ruthlessness, the Russians occupied much of Austria and stripped its factories before finally bowing to American pressure and withdrawing. Unfortunately for later historians, the Russians took with them (or destroyed) many of the plant records and historical documents.

The American general, Mark Clark, became military governor of the American zone in Austria, which included Steyr. Through him, the company received permission to retool and begin producing hunting rifles once again. By 1950 it had an updated version of the Mannlicher-Schönauer rifle and was exporting to the United States. It was a great time to be a gun company: America's postwar passion for shooting created de-

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mand for rifles of all kinds, and American shooters gobbled up every rifle they could get their hands on.

Through the 1950s, Steyr modified the Mannlicher in various ways to meet changing tastes but always retaining its trademark high quality. The end for the “gentleman’s rifle” came in 1973, when spiraling costs in Europe priced it out of the market.

Already, Steyr was working on new designs, the most significant being the military AUG. It employed the most modern materials and manufacturing methods to create a rifle that was, to put it mildly, futuristic. A bullpup, with its breech and magazine in the buttstock and instantly interchangeable barrels, the AUG is a compact military arm that certainly lives up to its “universal” designation. With a longer barrel and bipod, it became suitable for intermediate sniping purposes; with a short barrel and fold-down forend, it was as compact as a submachine gun. In fact, Steyr makes a submachine gun variant in 9x19mm. The AUG was adopted by Austria and a dozen other countries and paramilitary forces, including U.S. Customs.

Its deadly, futuristic appearance made the AUG a symbol for both rifle lovers and haters, and it was naturally included in the 1994 assault-weapons ban in the U.S. When that expired, pent-up demand made the AUG an object of almost unobtainable desire. Today, it is marketed in a variety of guises and colors, for everything from paramilitary use to civilian hunting.

Steyr acknowledged its status by establishing a subsidiary, Steyr USA, with distribution and service provided from a new headquarters near Birmingham, Alabama. Steyr USA is the importer of the complete range of Steyr products, including the AUG, some more traditional sporting rifles and shotguns and a range of semiautomatic pistols. Each, in its own way, provides competition for the most

modern offerings of its competitors, yet each includes Steyr’s trademark originality that might even be called quirky.

For almost 150 years, Steyr has had its own way of doing things – but always, *always* obeying Josef Werndl’s dictum of “innovation and high quality.” It seems to work. Business professors, take note. 

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Gunsite Scout Rifle

Shooting Ruger's 5.56 NATO Variant

John Haviland

Buoyed by the success of its Gunsite Scout Rifle chambered in .308 Winchester, Sturm, Ruger & Co. now chambers the Scout in 5.56mm NATO. Ruger developed the rifle in conjunction with Gunsite Academy, a firearms training facility in Arizona founded by the late Jeff Cooper, who developed the concept of the scout rifle. Ruger's rifle is a fairly close rendition of Cooper's notion that a scout rifle "... must be short, light, and quick to use as is technically compatible with adequate power and useful accuracy," as he wrote in his article "The Scout Rifle Idea" in the 1984 *Gun Digest*. To further develop that role, the Ruger Scout includes a 16.1-inch barrel with a flash suppressor, detachable 10-round magazine, three sight options and spacers to adjust the length of pull of a laminated wood stock.



A regular scope mounted over the receiver of the Ruger Scout rifle allows keeping both eyes open while shooting. "Gunsite Scout Rifle" decorates the head of the grip of the laminated stock.

The Ruger Scout is based on the M77 Mark II short action that Ruger has used for its rifles going on 24 years. The Mark II's extractor provides complete control of a cartridge from the time it's stripped from a staggered box magazine until the fired case is ejected. However, the Scout's detachable magazine holds cartridges in a straight stack aligned with the center of the magazine well. Cartridges in this position cancel the controlled-round feed feature, because the cartridge rim does not slip up under the extractor claw until the bolt is nearly closed.

Not that there was any complaint about how well the Scout handled cartridges. Because cartridges are aligned with the chamber, a minimum amount of shove on the bolt handle is required to strip one from the magazine and push it up the feed ramp and into the chamber. The rifle cycled without a single hitch while firing several hundred rounds.

Tactical is the trend in rifles these days, and it seems nobody can maneuver unless their rifle has an extremely short barrel. Cooper wrote that one goal of a scout rifle is compactness. The Ruger's 16.1-inch barrel certainly makes the rifle short with a length of 35 $\frac{7}{8}$ inches. Muzzle blast and flash are quite substantial from the short barrel. The Ruger has a flash suppressor, but it increases rifle length 1 $\frac{1}{2}$ inches. If the rifle had a 20-inch barrel, there would be no need for a flash suppressor, and the rifle would be just as handy. Plus the longer barrel would gain at least 200 to 300 fps in velocity. For example, Remington UMC .223 Remington factory loads with 45-grain JHP bullets turned in a velocity of 3,231 fps from the Ruger's 16.1-inch barrel. The same load registered 230 fps faster from a .223 with a 20-inch barrel. Even though the Ruger's barrel has a one-in-8-inch rifling twist, there is little use shooting bullets

heavier than 55 grains, due to a significant loss of velocity. A small amount of that velocity loss may be from the 5.56 NATO chamber cut that has a longer lead into the rifling than a .223 Remington chamber.

Cooper stated he liked a 3-pound trigger pull and "... a fine trigger is the single most important *desideratum* in any rifle." The Scout's LC6 trigger has no means for adjustment, and right from the factory, the trigger had a bit of creep and was stiff at 5 pounds. But the trigger lightened up the more it was used. A couple of weeks ago, the pull had lightened to 4.5 pounds and eventually to 4 pounds, still with a slight amount of creep.

Cooper wrote: "The scout rifle should weigh less than seven pounds, with scope and sling in place, but unloaded..." and noted the best way to meet that limit was with a plastic stock. The Ruger Scout's laminated wood stock weighs 2 pounds, 3 ounces with the recoil pad in place. That weight, though, makes the Scout's laminated stock rigid enough to use as a pry bar. A steel cross bolt through the one-inch thick supporting wood behind the recoil lug mortise and another just be-

hind the magazine well cut further strengthen the stock.

The receiver recoil lug is a relatively short .25 inch. The lug is pulled back and down by the front guard screw threaded into the lug at an angle, and thick supporting laminated wood reinforced with cross bolts guarantees a tight lockup of the receiver and stock.

The stock has panels of point-pattern checkering on both sides of the grip and wrapped around the forearm. Diamonds are small but well-shaped and sharp. "Gunsite Scout Rifle" is cut on the head of the grip, accompanied by "Ruger Gunsite Scout" rolled on the left side of the receiver. The forearm is 10.5 inches long, measured from the front of the magazine, and about 1.7 inches in cross section. If I were dictator, I'd cut 3 inches off the forearm and slim it to lighten the stock. The grip is also somewhat thick, but it fits my hand and positions my index finger on the trigger.

The Scout's length of pull is adjustable from 12.75 to 14.25 inches. The rifle comes from the factory with a one-inch thick rubber recoil pad and one of three .5-inch thick spacers installed. That provides a

Jeff Cooper developed the scout rifle idea and wrote about its features in the 1984 Gun Digest.



Gunsite Scout Rifle



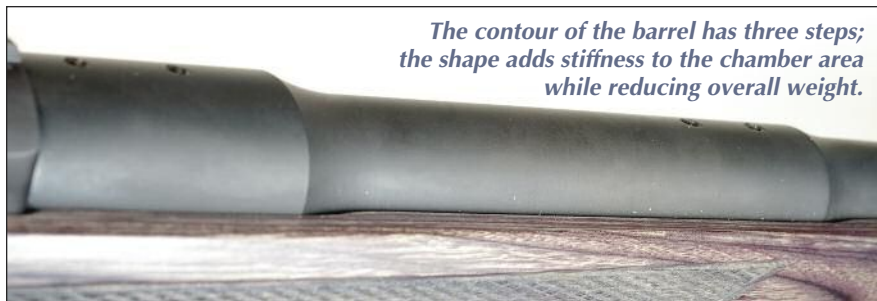
The Scout's flash suppressor looks like a birdcage and can be unscrewed from the muzzle of the rifle's short, 16.1-inch barrel.



13.5-inch length of pull, which is right for me. Pull length can be adjusted by using a supplied hex wrench to remove the recoil pad screws and add any combination of spacers. The toe of the stock is angled back, and the recoil pad follows that line. That gives the toe a bobbed off look, but it keeps the soft pad from snagging on a shirt or coat when bringing the rifle to bear.

Cooper wanted a scout rifle equipped with iron and optical sights. His iron sights consisted of a square front post together with a large aperture mounted on the receiver bridge. The scope had long eye relief with the ocular lens flush with the front of the magazine well. This long eye relief scope obscured little of the shooter's vision and allowed keeping both eyes open to see the entire target area.

The Ruger Scout does it one better with three sight options. The first is a steel aperture rear sight, mounted with a screw on the receiver bridge, and a front serrated blade. Protective wings guard against blows to the sights. The second is a Picatinny rail on the top of the barrel that extends 6 inches in front of the receiver to mount an extended eye relief scope or other optics. The third is a set of Ruger clamp-on rings to mount a regular scope over the receiver.



The contour of the barrel has three steps; the shape adds stiffness to the chamber area while reducing overall weight.

The rear aperture sight is adjusted for windage and elevation by loosening a setscrew on the left or right side of the sight body. The threaded aperture stem is rotated up or down for elevation and moved left or right for windage correction. One full turn of the stem moves bullet impact approximately 5 inches up or down at 100 yards. However, the sight has no marks to denote a precise amount of lateral movement, so sight correction consists of shooting a couple of shots, adjusting and shooting a couple more until it is dialed in. I shot the Scout while aiming with the aperture. Four- to 5-inch groups at 100 yards were the best I shot. The aperture sits up fairly high on the receiver bridge and must be removed so it does not block the view of an extended eye relief scope mounted on the forward Picatinny rail or a regular scope in rings over the receiver. Also, the rail on the barrel must be removed to make room for a scope with an objective lens larger than 33mm mounted over the receiver.

The problem with extended eye relief scopes is they have a narrow field of view for their magnification. Leupold's FX-II Scout IER 2.5x 28mm scope has a 22-foot field of view at 100 yards. In comparison, Leupold's VX-L 3.5-10x 50mm scope has a 30-foot wide view at 3.5x. I can keep both eyes open and see most of the space around a target while aiming with the Leupold variable scope. So no disrespect to the scout rifle theory, but there is no disadvantage in using a traditional scope mounted over the receiver. The Scout weighed right at 9 pounds with the Leupold VX-L scope clamped in the Ruger rings.

From a solid rest on a bench, the rifle shot five-shot groups hovering around 1.5 inches at 100 yards using five factory loads. Handloads shot somewhat tighter groups. The rifle shot handloaded Nosler 50-grain Ballistic Tips really well, with Berger 50-grain Varmint bullets not far behind.

To see if velocities could be increased from the Scout's 16.1-inch barrel, the Ballistic Tips were



Left, the front sight consists of a blade with protective wings. Below, the rear iron sight consists of an aperture that is adjustable for windage and elevation.



Table I **Ruger Gunsite 5.56mm Scout Rifle Shooting Results .223 Remington Factory Loads**

bullet (grains)	velocity (fps)	5-shot, 100-yard group (inches)
40 Winchester Supreme BST	3,196	1.46
45 Remington UMC JHP	3,231	1.77
55 Federal Sierra HP	2,999	1.54
55 Nosler Varmageddon Tipped	2,738	1.66
50 Federal American Eagle Jacketed HP	3,043	1.38

loaded to near the 5.56x45mm NATO's maximum average pressure limit of 62,000 psi, which is higher than the .223's 55,000 psi. Western Powders' *Reloading & Load Data Guide*, edition 5.0, lists quite a few of these 5.56 NATO pressure limit loads for Accurate and Ramshot powders. With 28.2 grains of Accurate 2460, the Nosler 50-grain Ballistic Tips had a velocity of 3,305 fps from the short barrel. That speed is quite an increase over loads at the .223 Remington's pressure limit. Still, it's nearly 300

fps slower than the velocity Western Powders lists from a 24-inch barrel.

Cooper wrote, "... what matters is not what the equipment can do, but rather what it will do in the hands of its operator under field, rather than laboratory, conditions." To determine that his rifle would fire two shots apiece from five positions from standing to sitting, he considered keeping all 10

shots in 5 inches at 100 yards "excellent practical accuracy." My accuracy shooting the Scout while kneeling and standing requires improvement, but shooting sitting and prone, it was easy to keep three bullets in 2- or 3-inch circles at 100 yards.

I took the rifle on a six-hour walk looking for coyotes on a cool morning last fall. The rifle was heavy in my hand, but switching



The Ruger Scout is fed with a 10-round detachable magazine that aligns cartridges with the chamber.

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Gunsite Scout Rifle



Table II

.223 Remington Handloads

bullet (grains)	powder	charge (grains)	velocity (fps)	group (inches)
50 Berger Varmint	Varmint	26.0	2,814	.91
50 Nosler Ballistic Tip	A-2460	28.2	3,305	.46
	TAC	26.8	3,037	.80
55 Nosler Varmageddon Tipped	H-335	25.0	2,905	1.07
	VV-N133	24.9	3,088	1.30
69 Nosler Custom Competition	TAC	24.5	2,728	1.38

Notes: All loads were fired at 100 yards from a Ruger Gunsite 5.56mm Scout Rifle; group size is the average of five shots. CCI Small Rifle BR4 primers and Winchester cases were used throughout. Overall cartridge length was 2.26 inches.

Be Alert – Publisher cannot accept responsibility for errors in published load data.

Left, the LC6 trigger cannot be adjusted; after quite a bit of shooting, its pull weight was an acceptable 4 pounds. Right, three stock spacers enable adjusting length of pull from 12.75 to 14.25 inches.



back and forth from a trail to an elbow carry lessened the load, and it was comfortable to carry suspended over my shoulder by a sling.

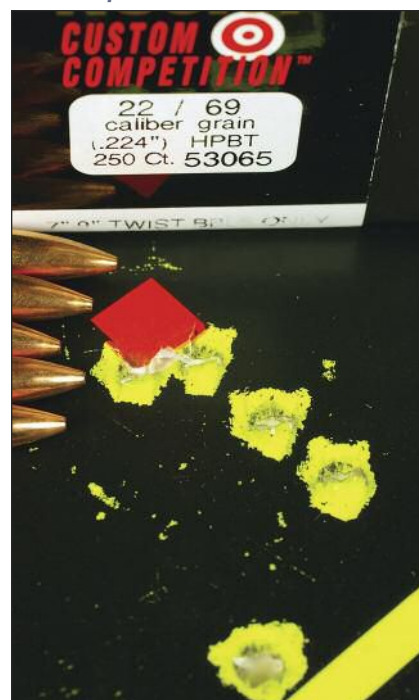
With the rifle hung across my chest with the sling, I crawled to the crest of a ridge and sat in a sagebrush thicket. After glassing for the longest time, I spotted the pointed ears of a coyote sticking above the sage below. The coyote ducked in and out of sight. When it was hidden, I stuffed my pack in

a sagebrush clump for a rifle rest, turned the power up on the scope and waited. The coyote finally wandered into the open. The distance was 300 and some yards, and when it turned broadside, the crosshair steadied over its back and the rifle fired. The *thud* of the bullet strike came back after the

rifle report faded. The coyote ran a short, frantic dash.

It'd be nice to think that shot was all my skill, but the Ruger Scout contributed more than its share to that excellent practical result. ■

This group was shot with Nosler 69-grain Custom Competition bullets and TAC powder.



The Scout showed a preference for handloads with Nosler 50-grain Ballistic Tips and A-2460 powder.



This group with Nosler 55-grain Varmageddon Tipped bullets and H-335 is about how well the rifle shot with factory loads or handloads.





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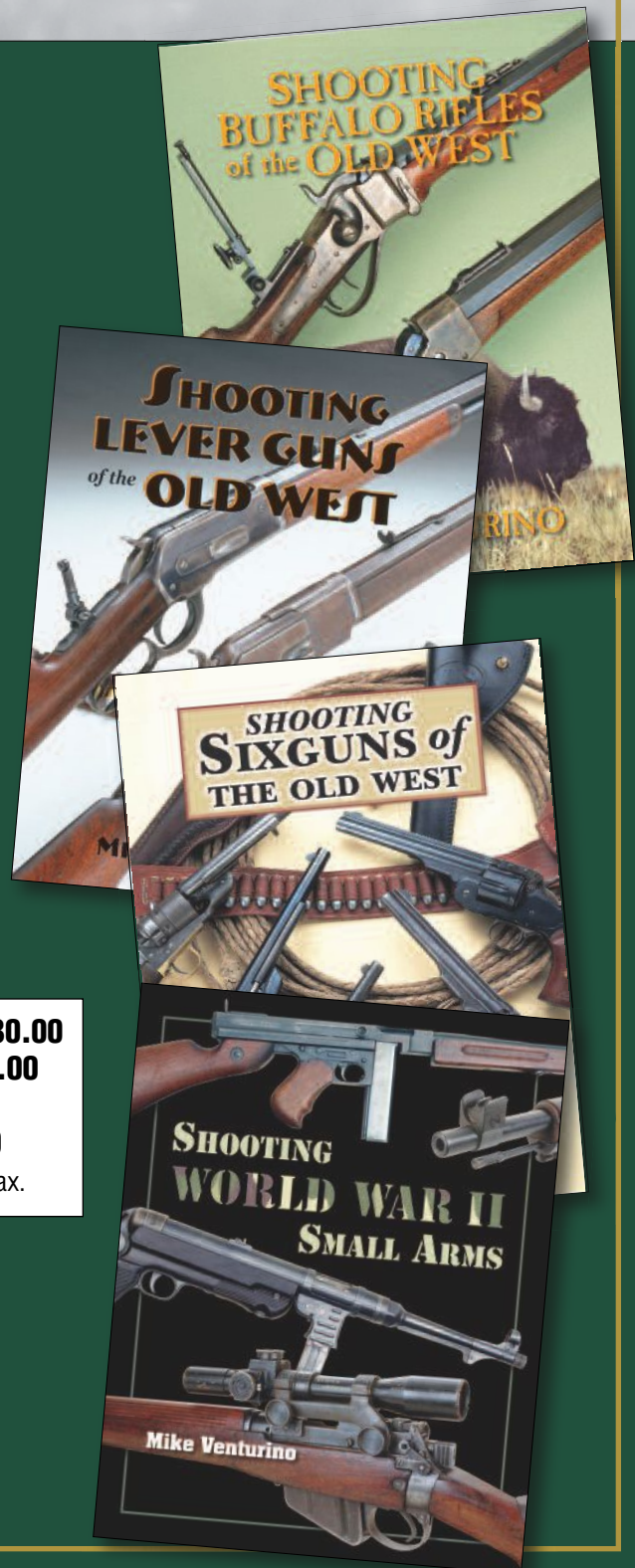
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Brian Pearce

After developing a series of proprietary magnum rifle cartridges during the 1940s and 1950s, Roy Weatherby began working to develop a new action that first appeared in 1957 with production underway in California by 1958. The new rifle was known as the Mark V, which was hailed as having “the world’s strongest action.”

The forged receiver is round and machined with an integral recoil lug. Much of its strength can be attributed to its nine forward locking lugs that are the same diameter as the bolt body. The bolt face is counter-sunk and fitted with a plunger ejector and rotating extractor. Destruction testing proved its unusual strength, as well as it providing outstanding gas protection to the shooter in the unlikely event of a ruptured case.

Sporting rifles of this period were generally heavy, at

A Brace of Weatherbys

least by today’s standards. With demand for lighter and lighter rifles, especially those in .30 caliber or smaller, Weatherby responded with a six-lug action that weighed around 10 ounces less than its nine-lug counterpart. The Ultra Lightweight rifle weighs just 5¾ pounds and is available in .240 Weatherby Magnum, .270 Winchester, 7mm-08 Remington, .308 Winchester and .30-06. The Ultra Lightweight is also available with the nine-lug action for the most popular Weatherby magnum calibers, including the .257, .270, 7mm and .300, but it’s also offered in the 7mm Remington and .300 Winchester Magnums. With a No. 2 contoured, 26-inch barrel, it weighs 6¾ pounds, an excellent blend of carry weight and balance. It also offers enough barrel length to help achieve the velocities advertised with magnum calibers, but this rifle is not so light that it increases recoil beyond normal comfort levels.



For the purposes of this article, a Mark V Ultra Lightweight 7mm Weatherby Magnum was used. It is an excellent general-purpose, big-game cartridge that dates back to 1944. It offers a ballistic advantage over the popular 7mm Remington Magnum, and due to its flat trajectory is at home taking game in open country where long shots are the rule. When stoked with tough hunting bullets, it is also suitable for heavier game, such as elk, moose or African plains game.

The history of the Mark V is not only interesting but also important to better understand today’s rifle. In Weatherby’s early years, Roy built custom rifles on many different actions, including 1903 Springfields, Winchester Model 70s, FN commercial Mauser 98s, Brevex Magnum Mausers, Schultz & Larsens and others. But Roy wanted an action designed specifically for the size and pressures generated by his cartridges.



At left are the Vanguard Series 2 Kryptek .30-06 (top) and Mark V Ultra Lightweight 7mm Weatherby Magnum (bottom).

in design. The bolt operation is smooth and can be cycled with the rifle at the shoulder without binding. The floorplate latch is positive and easier to operate. Barrel quality is match grade and better than any previous barrels found on production Mark V rifles, and they're available with "field" or recessed "target" crowns. There are several small but important design changes that have further improved and refined the rifle, and with advancements in machining technology, the current Mark V is the most precise version to date.

The Ultra Lightweight rifle features a synthetic stock that is hand-laminated with a state-of-the-art blend of materials that include aramid, graphite and fiberglass. It is aluminum bedded (CNC machined) in the receiver area, which also extends back into the pistol grip for added strength. The barrel channel contacts the barrel full-length, and there is a built-in pressure point near the forend tip. The stock is of Monte Carlo design with a rollover cheekpiece and is attractively finished with a dark tan or light brown undertone color with black speckle overlay. The barrel is blackened stainless steel with wide flutes to reduce weight.

A Leupold VX-2 4-12x 40mm A.O. scope was installed on the test rifle using Leupold QR bases and rings, all of which helped keep the over-

New rifles raise the accuracy bar and lower weight.

After four years in development, Mark V production was underway in California. As early as 1959, J.P. Sauer in West Germany began producing the Mark V. By 1971 Howa Machinery in Japan began supplying Weatherby with the Mark V rifle. Then in 1995, production was moved to Maine. In the last few years, production has come full circle with the Mark V being produced in Paso Robles, California, under the Weatherby roof.

With each manufacturing "move" there have been design changes that have improved reliability and performance. For example, the two-

position safety is smoother, renders the trigger inoperable and blocks the firing pin. The trigger assembly is factory-tuned to break cleanly at 3½ pounds, but it's also fully adjustable, more positive and simpler



A Brace of Weatherbys

all weight down. Its performance was flawless.

There are at least 10 loads available for the 7mm Weatherby Magnum from Federal Cartridge, Norma, NoslerCustom and Weatherby. Bullet weights range from 140 to 175 grains and are offered in a variety of hunting designs for any practical application, resulting in outstanding versatility. Three factory loads (two Weatherby and one NoslerCustom) were tried, and as can be seen in the accompanying table, all loads stayed under one inch with four-shot groups. Several groups were fired from a rather hot barrel, and group size only increased slightly.

Handloads were also tried. Using the Sierra 160-grain spitzer, 72.5 grains of Alliant Reloder 22 powder, Federal 215 primer and a Weatherby case, velocity was 3,180 fps and groups hovered around .70 inch.

THE VANGUARD SERIES 2

While negotiating Mark V production agreements with Howa Machinery, beginning around 1970 Weatherby began importing its Vanguard rifle, which is essentially a Howa Model 1500 but with Weatherby specified upgrades and



The Mark V disassembled shows the strength of the unique design.

design changes. Initially it was offered in popular industry "standardized" cartridges, ranging from .243 Winchester through .300 Winchester Magnum. Over the years many cartridges have been added, including the .223 and .22-250 Remingtons, .338 Winchester Magnum, the .240, .257 and .300 Weatherby Magnums and select Winchester Short Magnums. The Vanguard has been expanded to include stainless steel, synthetic stocks, a varmint series and youth models. Generally speaking, it is priced notably less than the Mark V and intended

specifically to compete with Remington, Ruger, Savage and Winchester. It has become popular, with the action commonly used by gunsmiths to build custom rifles.

The receiver is a round, one-piece forging machined with an integral recoil lug. The forged bolt is one piece and is fluted to prevent binding and to aid with smooth operation. It features twin locking lugs for a conventional 90-degree bolt lift. The right lug is slotted, and there is a corresponding anti-bind rail machined full length in the right raceway. This combination results in an action that is easily cycled with the rifle held at the shoulder. The bolt face is countersunk and fitted with a plunger ejector and rotating extractor. The extractor is patterned after the proven M16 style, which is un-



The Mark V features a hinged floorplate with two guard screws that secure the bottom metal.



Bolt lift is approximately 54 degrees, which allows low scope mounting.

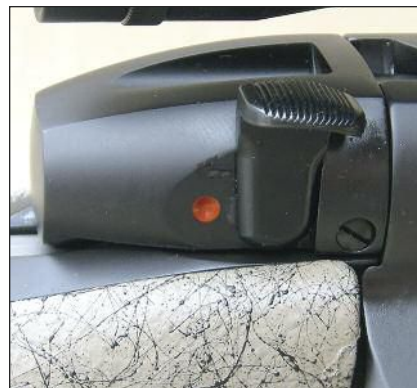


The Mark V bolt (top) features nine locking lugs, while the Vanguard (bottom) has a more conventional two-lug design.

usually durable and rarely breaks. The safety is two-position, and when in the rearmost position, it locks the bolt. Typical of most modern triggers, it is housed in an



Series 2 Vanguard rifles (left) feature a three-position safety. The Mark V (right) features a two-position safety.



assembly. Barrels are cold-hammer forged, which helps prevent stress and warping.

The Vanguard offers good shooter protection in the unlikely event of a ruptured primer or case. For example, there are three gas ports on the right side of the bolt body to direct gases laterally away from the shooter. Another vent directs gases down into the magazine. The left side of the receiver ring is drilled to further direct gases away

from the shooter, and for gases that may reach the rear of the bolt body, the fully enclosed bolt sleeve will offer additional protection.

The receiver, bottom metal and stock are secured with two guard screws. The trigger guard and magazine housing are a single unit constructed of alloy, but the hinged floorplate and latches are steel.

At a glance, the wood stock Vanguard appears similar to the Mark

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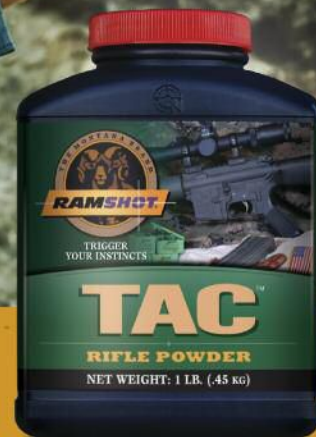
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A Brace of Weatherbys

V rifle, with Monte Carlo design, rollover cheekpiece, white-line spacers, rosewood forend cap, high-gloss finish, etc. As rifles with synthetic stocks became available, they followed the same profile, but select models have been offered with classic styling.

The Vanguard Series 2 first appeared in 2011, with a few notable changes from the original Vanguard. For example, the location of the extractor and plunger ejector have been slightly repositioned for more reliable function, and a new two-stage, adjustable trigger allows for a 2½-pound, creep-free pull. The sliding safety remains in the same location but has been changed to a three-position. In the middle position, cartridges can be removed from the chamber without allowing the rifle to fire. When the safety is in the “on” position, the bolt is locked. Stocks have been revamped to be more attractive, are trimmer and feature a

Specifications: Weatherby Mark V Ultra Lightweight

Caliber: 7mm Weatherby Magnum
Action: bolt, nine locking lugs, 54-degree lift
Barrel: wide fluted, No. 2 contour
Barrel length: 26 inches
Rifling twist rate: one turn in 10 inches
Sights: none
Trigger: fully adjustable, factory set at 3.5 pounds
Stock: Monte Carlo, synthetic, aluminum bedded
Safety: two-position
Weight: 6.75 pounds (5.75 pounds, six-lug version)
Magazine capacity: 3+1
MSRP: \$2,100

thick, rubber recoil pad to reduce felt recoil.

Perhaps the most significant change is Weatherby's accuracy guarantee: All Weatherby Vanguard Series 2 rifles are guaranteed to shoot a three-shot group of .99 inch or less at 100 yards (sub-MOA) when used with specified Weatherby factory or premium ammunition. Since the Series 2 appeared, I have used several of these rifles in developing loads for



In the unlikely event of a ruptured case, with these three bolt body vent holes, the Mark V diverts gases away from the shooter.

Specifications: Weatherby Vanguard Series 2 Kryptek

Caliber: .30-06
Action: bolt, two locking lugs, 90-degree lift
Barrel: round, No. 2 contour
Barrel length: 24 inches
Rifling twist rate: one turn in 10 inches
Sights: none
Trigger pull: fully adjustable, two-stage, factory set at 3.0 pounds
Stock: synthetic, Highlander camo pattern
Safety: three-position
Weight: 7.5 pounds
Magazine capacity: 5+1
MSRP: \$749

Wolfe Publishing's LoadData.com website. I can categorically state that so far, each rifle has met that accuracy guarantee, usually by a large margin. For example, recently a Series 2 Synthetic Vanguard (MSRP \$649) chambered in .240 Weatherby Magnum was tested with Weatherby factory loads containing Nosler 95-grain Ballistic Tips that produced several three-shot groups that hovered around .5 inch.

Recently I had the opportunity to work with a Vanguard Series 2 Kryptek .30-06 with Highlander camouflage pattern. The stock pattern is unique, with a blend of browns, green and tan, printed in a reptile skin-like pattern, which is reported to have become popular with many younger shooters. It should be mentioned that there are many other synthetic stock finishes and options for the Van-

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load (grains)	advertised velocity (fps)	actual velocity (fps)	100-yard group (inches)
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140 NoslerCustom AccuBond	3,340	3,333	.65
140 Weatherby Barnes TSX	3,250	3,222	.80
160 Weatherby Nosler Partition	3,200	3,210	1.00
Weatherby Vanguard Series 2 Kryptek .30-06, 24-inch barrel:			
150 Barnes Vor-TX Tipped TSX	2,970	2,955	.80
150 Remington Core-Lokt	2,910	2,921	1.25
165 Federal Premium Partition	2,830	2,811	1.10
168 Barnes Vor-TX Tipped TSX	2,800	2,777	.55
180 Buffalo Bore spitzer	2,850	2,836	.90
180 Norma Oryx	2,700	2,689	1.00
180 Federal Premium Trophy Bonded	2,700	2,671	.80
180 Winchester Power Max Bonded	2,700	2,666	.90



The Ultra Lightweight stock is aluminum bedded for the receiver and features a pressure point near the forearm tip.

guard, along with traditional wood that include satin and high-gloss finishes.

The Kryptek stock is unusually rigid, particularly in the forearm, where it makes full-length contact with the barrel, which is something that is not frequently seen in production rifles.

The Series 2 Kryptek was mounted with a Leupold VX-3 4.5-14x A.O. scope using Talley Vanguard bases and rings. With the aid of a sand-

bag rest, eight factory loads were tried from Barnes, Buffalo Bore, Federal, Norma, Remington and Winchester, several of which are not considered to be "premium" accuracy loads. Six of the eight loads produced sub-MOA, four-shot groups with some hovering close to .5 inch, but the average of all eight loads was an impressive .9125 inch.

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The Vanguard Series 2 features the Weatherby stock design.

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Rifle: 6.5-08 Ackley

Action: Win Model 70

Load Specs:
Bullet: 6.5mm 140gr VLD
Powder: H4831



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Prior to the new century, I didn't know a German K98k from a Czech VZ24 or a Yugoslavian M48 or even a Brazilian M1908. Not only do I now have shooting samples of those last three, but also my racks hold a half-dozen K98ks. To complicate matters, every one of the aforementioned rifle models and scores more are based on Mauser's basic Model 1898 action. As such they are all bolt actions, cocking on opening with ammunition contained in integral box magazines holding five rounds.

The K98k



Here, two German paratroopers are equipped with an American Model 1919A4 machine gun. The third (at right) has a K98k.

Germany's Famous Mauser in Transition



Some of the K98k changes made as the war progressed were: (1) a flat buttplate, solid walnut stock and all machined and milled stock furniture; (2) a laminated stock and front sight hood; (3) cupped buttplate, and stock furniture is still milled but as the forend cap shows, not so intricately machined.



This K98k's "ar" code means it was made by Mauser-Werke in Berlin and the "42" means it was made in 1942.

The K98k's claims to fame are three. One is that it was Nazi Germany's primary battle rifle during World War II. Two is that it was made in greater numbers than other variations of the Mauser Model 1898; and three, it was produced in more factories than other Mauser Model 1898s.

The designation K98k often confuses the uninitiated. The capital *K* stands for *Karabiner*, which is German for short rifle. The lower case *k* stands for the final variation of *Karabiner 98*, which began back in World War I with the *Karabiner 98a*.

Germany's main battle rifle during World War I was the *Gewehr 1898*, often just written as *Gew98*. It had a 29.1-inch barrel, was slightly over 49 inches long and weighed over 9 pounds. Its sights consisted of a blade front dovetailed to a stud near the muzzle and an open rear sight graduated in 100-meter increments, starting at 400 meters and running to 2,000 meters. There were many troop complaints about the unwieldiness of the *Gew98* in trench warfare, so Germany began developing "short rifles" during the conflict.

Also, it was likely observed by German ordnance officers that

Model 1903-armed American infantry in 1918 did excellent shooting with their 24-inch barreled rifles. In essence the U.S. Model 1903 was simply a Mauser Model 1898 in disguise. (Peter Paul Mauser actually sued the U.S. government for patent infringement and won.)

Curiously, the eventual K98k was inspired by a variation of the Mauser Model 1898 requested by the German postal service (*Reichspost*). In that country and at that time, their postal service contained a security organization called the *Postschutz* that was organized on paramilitary lines.



This barrel stamp indicates bore diameter of 7.91(mm) on an early K98k.

Postschutz asked for Mauser-Werke A.G. Oberndorf to make "short" rifles for them similar to ones then being sold to China and Mexico. Barrel length was reduced to 23.6 inches and weight to nearly 8 pounds; overall length was about 43.5 inches.

There is an interesting comment about *Reichspost* rifles in *Backbone of the Wehrmacht* by Richard D. Law. In it, a German official from the 1930s is quoted as saying that inside the Mauser factory the name *Reichspost* was a camouflage name for rifles also being sent to Nazi political organizations such as the SA and SS.

Reichspost 98 Mausers most certainly did make it into German military hands. The sample I was able to photograph for this article was a World War II battlefield pickup in almost pristine condition. One photo shows why collectors refer to these early Nazi-era Mausers as "Banner" rifles. The Mauser logo is prominent atop the action's receiver ring, along with the year of manufacture.

In 1934 the *Heereswaffenamt* (army weapons office) decided that all three branches of the German military, consisting of army, navy and air force, were going to be armed with the same rifle, and it would be based on the *Reichspost* model. In mid-year 1935, this rifle, with minor changes, became the K98k. There are two features that help identify *Reichspost* Mausers from K98ks. The finger grooves on the stocks are omitted in the latter version and instead of the Mauser "Banner" atop the receiver there are codes.

Those codes are a confusing subject in themselves, because they were changed several times, even for the same factory. (An accompanying table matches the codes with respective factories.) The year of manufacture was also stamped along with the makers' codes on all K98ks. Another way to sort K98ks from so many other



This close-up of a 1944 K98k shows the pressures of wartime production reduced the amount of time spent on exterior finishing; no polishing was done on this barrel.

The K98k



nations' Model 1898 Mausers is that their bolt handles were turned down instead of projecting straight out. There is a clearance cut in the stocks to facilitate grasping the bolt knob.

Germany's adoption of the K98k was the official beginning of a firearms manufacturing feat that rivaled the American one of producing over 6.24 million M1 Carabines or 4 million M1 Garands during 1941/1945. According to various reference works pertaining to military Mausers, between 11.5 million (*Military Mauser Rifles of the World 3rd Edition* by Robert W.D. Ball) and 14 million (*Backbone of the Wehrmacht*) were manufactured before the surrender of Germany in May 1945.

At this point it may be worthwhile to interject a bit of personal observation. I've read and have been asked the following question many times: "Why did Germany adopt a bolt-action rifle for its military services when they had to know that America and the Soviet Union were in the process of developing semiauto battle rifles?" The answer is Germany's military dogma of the 1930s was geared to *Blitzkrieg* (Lightning War), fast-moving, armored columns surrounding large numbers of enemy



This photo shows the German propensity for stamping serial numbers on as many parts as possible.

and forcing their surrender or decimation. Infantrymen were supposed to serve the secondary purpose of mopping up encircled areas. As the war proved, infantry combat was still of extreme importance, and belatedly the *Heereswaffenamt* scrambled to develop faster-firing infantry rifles – both semiautomatic and select fire types.

Caliber for the K98k from beginning to end was the 7.92x57mm, sometimes also referred to as 7.9x57mm but universally named by American ammunition manufacturers as the 8mm Mauser. (Late in the war there was some testing done with the diminutive 7.92x33mm Kurz in K98ks, but it went nowhere.)

With typical German thoroughness until wartime urgency stopped it, every K98k's barrel was measured, and its bore diameter was stamped atop it just in front of the receiver ring. According to Law's

abovementioned book, K98ks have been observed stamped 7.90, 7.9, 7.91, 7.92, 7.93 and 7.94. Of course, those numbers stand for millimeters. The method for determining bore diameters was to push a plug gauge through it. The largest size passing freely was stamped atop the barrel.

This interesting practice was stopped in 1942. Of my K98ks, one made in 1938 is marked 7.9 and one made in 1940 is stamped 7.91. Four other K98ks were made from 1942 to 1944, and none have the barrel dimension stamping. Worthy of note is that I also have two Czech-made G33/40 carbines made specifically for *Gibirgstruppen* (mountain troops). Their barrel bore stamps are 7.88.

As would be expected of a firearm produced for a decade in such huge numbers and by so many factories, there were numerous minor changes in K98ks. Stocks

This short, side-rail mounted scope is an example of the serial numbering of K98ks. The serial number is 7880 I. Every time the factory reached 9,999, it started over with 0001 but added the next letter of the alphabet.



Although very rare, only K98ks with BCD codes had extra thick left side rails on their actions, built intentionally to be drilled and tapped for long side-rail scope mounts.



The forend cap and front barrel band are from a 1944 rifle. Those parts are now stamped and welded.



This forend cap and front barrel band are circa 1942 when they were still milled but with less attention to detail.



evolved from solid walnut to laminated beech; steel stock furniture transitioned from milled to less intricately machined, to stamped and welded. Late 1939 front sights gained hoods. Early K98ks received beautiful rust bluing for metal finish, but late war versions were given a black phosphate coating akin to America's Parkerizing, with faint signs of polishing if any. By war's end, bayonet lugs were eliminated, and sometimes barrel bands were secured with wood screws.

Something that did not change was the German's obsession with stamping various markings all over their rifles. Besides serial numbers and manufacturers' codes, there were *Waffenamts*, or inspectors' acceptance stamps. These can be found on most major component parts, such as barrels, re-

ceivers and also on stocks. For instance, a receiver on the right front ring should have three *Waffenamts*. The rearmost signifies that the receiver was inspected. The middle one does the same for the barrel, bolt and trigger. The front one shows that the barrel sight, bolt, trigger mechanism and magazine have been accepted. Early on K98ks received at least the last couple of digits of their serial numbers on nearly every part large enough to hold it. As the stresses of wartime production grew, the profusion of serial numbered parts on K98ks decreased.

Serial numbers can also be confusing and misleading. It would be normal to think that a K98k is of early manufacture if it carries only

a four digit serial number. For most K98k production, all serial numbers were four digits, ranging from 0001 to 9999. Then they started over at 0001a and went to 9999a. This went on through the entire alphabet. After 9999z, some factories had 0001aa, and so forth. To add to the mystery, some manufacturers eventually transitioned to five digit serial numbers.

According to this system, my 1937 K98k with code S/147 was the 11,229th one made by J.P. Saur & Sohn, because its serial number is 1230a. At this point, it should be noted that many of today's K98ks do not have matching serial numbers on their bolts. When Germany surrendered in May 1945, K98k-armed troops entering Amer-



This Mauser logo was the reason pre-K98k rifles such as the Reichpost model are called "Banner" rifles by today's collectors. Note the rifle's finger grooves in the stock.



Two types of cupped steel buttplates were put on K98ks. The standard one was smooth. The checkered one was installed only on some versions of sniper rifles.



The K98k

ican captivity were usually instructed to remove their rifles' bolts and throw them in one pile. The rest of the rifle was discarded in another pile.

Later it was common for U.S. soldiers to rummage through the piles for souvenirs. (It is rather doubtful if British or Soviet troops were allowed that freedom. Perhaps Canadians were?) Since it was virtually impossible to properly match bolt and rifle serial numbers, they satisfied themselves if a bolt would close in a chosen rifle. Headspace was not necessarily correct, so a K98k with a mismatched bolt should have its headspace checked by a gunsmith prior to firing. My 1937 rifle has a mismatched bolt, but not being aware of the above when I bought it in 2000, it was fired "as is." Luckily, its headspace was correct.

A natural question here would be, "How come some K98ks do have bolts with matching serial numbers?" They could have been battlefield pickups or taken from storage in armories or factories at war's end. Today, among collectors, all matching K98ks in very good condition commonly sell for \$2,000. Those with mismatched parts in poor condition sell for a few hundred dollars. Then there are what are called "force-matched" parts. Most commonly these were captured, primarily by the Soviet Union, who refurbished them and scratched on new numbers using electro-pencils. These don't bring high prices either.

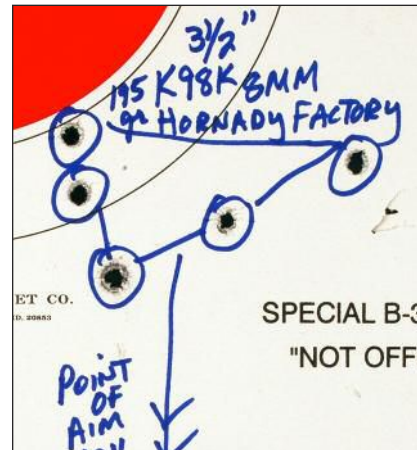
K98k Manufacturers and Codes	
manufacturer	codes
Mausser-Werke, Oberndorf	.S/42K, S/42G, S/42, 42, BYF, and SVW
Mausser-Werke, Berlin-Borsigwalde	.S/243G, S/243, 243, and ar
Sauer & Sohn, Suhl	.S/147, S/147K, S147G, 147, and ce
Berlin-Lubecker Maschinenfabrik, Lubeck	.S/237 and 237
Waffenfabrik Brunn, Czechoslovakia	.945, dot, dou and swp
Feinmechanische Werke, Erfurt (Erma)	.S27, 27 and ax
Gustloff-Werke, Weimar	.bcd and 337
Steyr-Daimler-Puch, Steyr (Austria)	.660 and bnz
Berlin-Suyler Waffenwerke	.bsw

Note: This basic listing of manufacturers' codes is compiled from information found in *Backbone of the Wehrmacht* by Richard D. Law and *Military Mauser Rifles of the World 3rd Edition* by Robert W. D. Ball.



Left, for K98k 8x57mm rifles, Mike has worked to duplicate German ballistics for the sS Patrone load with 198-grain bullets; at left is an sS Patrone cartridge, middle is a Hornady 195-grain handload, right is a Sierra 200-grain HPBT handload. Below, Mike's 1937 vintage K98k is capable of about 3- to 4-inch groups at 100 yards with open sights; it also hits about a foot high at 100 yards and probably was actually given a battle zero of 300 meters.

From a shooter's viewpoint, this following information should be interesting. While all K98ks were proof-tested, from each manufacturing batch, specimens were selected for accuracy testing. Usually this was done in underground, 100-meter ranges at paper targets. Quite a bit of the shooting was done by experienced civilian marksmen, but some was also done from mechanical rests. According to Law's book, a K98k had to deliver five bullets into a 120mm (4.72 inches) circle at 100 meters. Otherwise it was sent back and inspected for problems. When shoulder-fired, only the issue open



rear sight with blade front was used. An optical arrangement was affixed to those fired in machine rests.

By modern American rifleman standards, five shots in 120mm isn't much to be proud of, but evidently it was acceptable for the German military. Only one of my K98ks wears only iron sights, the 1937 one. The other five are scoped. With the 1937 K98k, sometimes groups are tighter, but on the average they are more in the

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3- to 4-MOA range. The scoped K98ks will group five shots into less than 2 MOA at 100 yards, sometimes much less.

The ammunition used in group shooting discussed above are handloads developed to equal ballistics of Germany's World War II sS Patrone – 198-grain FMJ bullets at 2,500 fps plus. That handload consists of 195-grain Hornady Spire Points or 200-grain Sierra or Nosler HPBT bullets over 47 grains of Varget, most commonly in Winchester brass with Winchester Large Rifle primers.

While on the subject of shooting K98ks, battle zero should be mentioned. Although the rear sights of K98ks were graduated from 100 to 2,000 meters in 100-meter increments, I've never encountered one actually sighted for 100 meters. Most of mine are on at 300 meters, and a very knowledgeable military and firearms historian told me almost every European battle rifle he has fired had a 300-meter zero. It's an interesting conundrum.

Although the K98k will forever be strongly associated with the Nazi era of Germany, it is interesting to note that a few other nations did purchase the model. China did so in 1937/1938, accepting K98ks built of parts rejected by Wehrmacht inspectors. These rifles were safe but of less quality than was considered standard by the Germans for themselves. Since Japan and China were at war in those years, the Japanese government objected to Germany selling rifles to its enemy. So the Chinese were left hanging, and K98ks went to Japan instead. Portugal and Sweden also bought some K98ks prior to Germany wartime demands precluding more sales. It's also interesting to note that Israel bought thousands of K98ks left in various European nations after Germany's surrender. Many of those were later converted to 7.62mm NATO.

The K98k was both the apogee and finality of Mauser rifles for Germany's military. R



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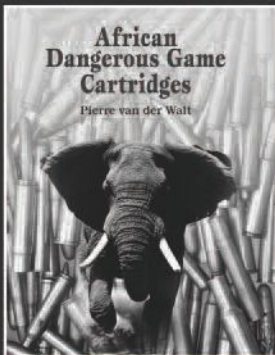
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John Barsness

Gun writers receive frequent e-mails and snail-mails from readers asking: "Why don't more rifle companies chamber the ___?" You can fill in the blank, because surely there's some cartridge you feel firearms manufacturers have not treated fairly over the years. If only Remington, Ruger or Winchester gave your favorite a chance, other shooters would appreciate its outstanding virtues!

My most recent edition of *Cartridges of the World* lists over 500 centerfire rifle cartridges chambered at one time or another in commercial rifles. This total doesn't include wildcats, homemade cartridges dreamed up by gunsmiths and rifle loonies, that may have been only chambered in one rifle – or perhaps in more rifles than some less-successful commercial rounds. (During a recent discussion, a friend suggested there are far more .22 K-Hornets on earth than .256 Winchester Magnums, and probably more 6.5-06s than 6.5mm Remington Magnums.)

Sometimes old commercial rounds do get revived. Quite a few obsolete black-powder cartridges reappeared during the current BPCR fun. Who knew the .38-72 WCF and .45-120 Sharps would make a comeback? And when African safaris became more affordable than some North American elk hunts, many Americans decided it simply wouldn't do to hunt Cape

Why Don't They Chamber the _____?

Total sales volume eliminates favorite cartridges.

buffalo with a bolt action. Instead they had to buy a big double rifle, thus imitating British colonials who sneered at “repeaters.” As a result, American companies started making .450/.400 and .470 Nitro Express ammunition.

This illustrates one basic principle of rifle-cartridge demand, which is, of course, a basic principle of capitalism: If there’s enough consumer demand to make money, then some company will chamber rifles for “the __?” If there isn’t enough demand, they won’t.

One cartridge often suggested as a perfect candidate for factory rifles is the 7x57mm Mauser. While American companies have cranked out quite a few 7x57s over the years, right now even Ruger doesn’t chamber it in the No. 1 single shot, and until recently the No. 1A was the only commercial 7x57 available in the U.S.

A number of European companies still make 7x57s,

is highly desirable due to mostly theoretical advantages, such as lighter weight and finer accuracy.

When good factory loads aren’t widely available, and handloading data is all over the place, most hunters aren’t going to bother. Why would they, when they can just buy a .308 Winchester?

Even commercial rounds like the .348 Winchester suffered from changes in technology. The .348 itself was a supposed improvement over the .33 Winchester, the first medium-bore smokeless round for Winchester lever actions, but in the 1950s, Winchester chambered the .358 Winchester in its modern Model 88 lever rifle *and* the bolt-action Model 70, and the .348 essentially died. While a very few single-shot and double rifles were chambered in .348, it was essentially a one-rifle cartridge, chambered only in the Model 71, and no cartridge survives long when its one and only rifle ceases to be made.

Facing page, these loading dies for currently chambered factory rounds have loaded ammunition for ground squirrels to Cape buffalo, yet rifle loonies complain when factories don’t chamber their favorite, because somehow it works better. Right, this custom .243 Winchester was made in the 1950s, when many shooters still wanted one rifle to serve multiple purposes. Today’s avid hunters usually buy different rifles for different purposes.



but the cartridge is definitely fading on this side of the Atlantic, for several reasons. First, there’s the factory ammunition problem. No cartridge becomes very popular without abundant and effective factory loads, but American companies have been leery of the 7x57 ever since a bunch of Mexican Mausers ended up on our side of the border about a century ago, so they purposely download the round. While American 7x57 loads aren’t as bad as many people think, the .308 Winchester covers the same ground with abundant factory loads for every purpose.

Second, the throat length of 7x57mm chambers varies enormously, part of the cause of the factory load problem, and it also causes problems in handloading data. Thus it’s impossible for any component company to put together data that really takes advantage of the cartridge’s capabilities. Third, it won’t fit in a modern short action, which many of today’s rifle loonies feel

While the .348 was nostalgically revived in the limited-production Browning copy of the 71, the only three centerfire *rifle* cartridges that have remained popular in traditional tube-magazine, outside-hammer lever rifles are the .30-30 Winchester, .35 Remington and .45-70. And just as the .348’s era passed quickly, newer cartridges for traditional lever actions have never really caught on.

This is because the 7mm Waters, .30 Marlin Express, .307 Winchester, .338 Marlin Express, .356 Winchester, .375 Winchester and .444 Marlin didn’t do anything Savage 99s, Winchester 88s and Marlin 1895s in .300 Savage, .308 Winchester, .358 Winchester and .45-70 didn’t already do. Yet American ammunition and rifle companies keep trying to “modernize” the traditional lever action with new cartridges. Unfortunately, most American hunters who want modern buy bolt actions. The few who want old-fashioned lever actions buy

Why Don't They?

.30-30s and .45-70s, because they can always find ammunition and brass.

However, slow sales aren't limited to uncommon lever-action rounds. The .260 Remington has perked up a little since laser rangefinders became widely available, because the high ballistic coefficients of 6.5mm bullets fit right into the increased popularity of long-range shooting. But .260 fans have always been disappointed that so few factory rifles have been chambered for their favorite, and once again there are several real reasons.

First, by the time Remington introduced the .260 Remington in 1997, its ballistics were already flanked by two highly successful rounds, the .25-06 and 7mm-08 Rem-



Above left, a century ago the 6.5x54 Mannlicher-Schönauer was the most popular 6.5mm cartridge on earth, but nobody asks about it anymore. Right, in the 1950s the .222 Remington in the 722 Remington rifle was the hottest varmint cartridge around. Today "special runs" of factory rifles are occasionally chambered for it.



ingtons. One selling point suggested the .260 could cover the jobs of both the .25-06 and 7mm-08, but apparently American hunters were

happy with simply using a .25-06 or a 7mm-08, partly because so many rifle companies already chambered them, and so many

Most American companies don't chamber the 7x57 or make a wide variety of factory ammunition, mostly because of wide variations in chamber dimensions.



Fans of the .260 Remington (left) think it's the greatest all-around centerfire for American hunting, but not very many people agree, partly because of other mild 6.5 cartridges, such as the 6.5 Creedmoor (center) and 6.5-284 (right).



Neither the .257 Roberts (left) nor the .25 WSSM (center) could compete with the .25-06 Remington (right), the dominant commercial .25-caliber cartridge since Remington "introduced" it in 1969.





John has taken a bunch of game with the .280 Remington, including this fine caribou held by guide Anthony Oogak. The .270 Winchester would have done just as well.

ammunition companies were making a wide variety of loads. How was a compromise rifle using less-available ammunition an improvement?

Still, many handloading fans of the .260 Remington continue to wonder (often publicly) why more companies don't chamber their favorite. After all, it can not only duplicate the .25-06 and 7mm-08 Remington but also, with lighter bullets, the .243 Winchester and .22-250 Remington.

Neither the .350 Remington Magnum nor the .35 Whelen set any sales records, yet some shooters firmly believe they're among the greatest cartridges ever developed.



However, the era of the avid American hunter with one center-fire rifle ended half a century ago. In the 1950s many shooters clearly remembered the Great Depression long after they'd landed a good job in Detroit or Seattle. As a result, selling the one-rifle idea still worked, one reason the .243 Winchester became so popular. Marketers sold the .243 as the perfect all-around centerfire, great for both deer hunting and off-season varmints, so slipping one into the household budget could be economically justified.

Within a decade or two, however, Baby Boomers who'd never known the Depression grew up and started buying lots of stuff, because they'd only seen boom-times. Younger hunters bought a different rifle for each purpose, and it's pretty much been that way ever since. Why would somebody buy a .260 Remington to duplicate several rifles they already have? Plus, even some .260 fans counter their own argument by owning several .260s. Do they want more rifle companies to chamber the .260 so they can buy yet another? Apparently rifle manufacturers don't see much market potential there.

Another "___?" cartridge frequently

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Why Don't They?

mentioned is the .280 Remington. Originally designed as a slightly lower-pressure version of the .270 Winchester for Remington's pump and semiautomatic rifles, the .280 has never become as popular as it should have, at least according to its fans. Instead, most hunters buy .270s because of the same old reasons - easily available rifles, ammunition and brass.

Fans of the .260 and .280 Remingtons often claim that if their favorite had been introduced before the .25-06, .270 and 7mm-08, it would be king today. That's like speculating on what would have happened if Henry VIII had never been born. He *was* born, and he *was* the King of England, and almost half a millennium after his death nothing has changed. In another 500 years, both the .270 Winchester and .280 Remington will probably be dead and gone as well, but like Henry VIII, the .270 Winchester will still have been king during its era.

Some "___?" cartridges have just about died because of technological changes. One such change began in 1948, when John Nosler invented a bullet called the Partition, but new super-bullets really started appearing in the last couple of decades of the twentieth century, bypassing any need for cartridges over .30 caliber for most North American hunting.

Long before premium bullets appeared, many hunters used moderate-velocity medium bores for game larger than deer, because bigger, heavier, slower bullets tended to penetrate elk, moose and big bears more reliably. While a few hunters are still too cheap to use premium bullets on large animals, very few of us shoot so many elk in a year that a handful of Nosler Partitions will break the household budget.

This is exactly why "___?" cartridges such as the .338-06 A-Square, .358 Winchester and .350 Remington Magnum are rarely chambered in factory rifles anymore, and why newer medium-bores like the .338 Federal and .338 Ruger Compact Magnum haven't appeared in a dozen brands of factory rifles. For hunters who really might need a powerful medium-bore, the .375 H&H has been around for over a century and the .338 Winchester Magnum for over half a century. Both have those eternal advantages of abundant rifles, factory

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ammunition and brass. (While a few people prefer .35-caliber rifle cartridges because they can be cheaply reloaded with cast handgun bullets, strange as it may seem, rifle manufacturers aren't in business to save handloaders money. In fact, the contrary is often true.)

One bright light, however, shines amid all this anti-diversity. Modern manufacturing makes it possible for manufacturers to profitably put together short manufacturing runs of rifles chambered for “__?” cartridges. In fact, in recent years the Ruger No. 1 single shot turned into exactly that. The peak of No. 1 popularity occurred a few decades ago, and only a few thousand are now produced each year. These days each model of No. 1 apparently appears in a single chambering, partly catering to No. 1 collectors who simply must have a factory rifle for every cartridge ever available.

This system also provides shooters with classic cartridges not available among the standard chamberings of most production rifles. In December 2014, the Ruger list included the 1A Light Sporter in .280 Remington, Varminter in .220 Swift, Medium Sporter in 9.3x62 Mauser, Tropical in .450/.400 Nitro Express 3-Inch and the full-length-stocked International in .257 Roberts. Now, *there's* a list of “__?” cartridges!

Of course, not everybody who wants a rifle in “__?” is willing to pay the \$1,000+ for a Ruger No. 1. In fact, most shooters want their “__?” cheap, the reason they ask why it's not chambered in the first place. Otherwise they'd just buy the factory rifle they want in a similar cartridge and have it rebarreled. This is also exactly why many shooters wanting a .250-3000 Savage don't buy a used Savage 99: It's been over 15 years since the last 99 left the Savage factory, and the price of rifles has gone up.

Another good example of this “I want it, but don't want to pay

much” syndrome is the Forbes rifle, the mass-produced version of the custom New Ultra Light Arms rifles made in West Virginia by Melvin Forbes, which have an enviable reputation for a combination of light weight and fine accuracy. Like new Ruger No. 1s, Forbes rifles aren't all that “affordable” (the marketing term for cheap) but can be made at less than half the price of NULA rifles by not offering as many options. Instead of getting to choose the chambering, barrel contour, length of pull and stock paint – all included in the price of a new NULA – you get the basic rifle exactly as it's offered. After the Forbes appeared, however, a bunch of shooters strongly suggested Forbes should offer “custom shop” options, especially different chamberings.

However, there's another option for shooters who really, truly want a rifle chambered for a less-popular cartridge, but want it cheap. It's easy for garage gunsmiths to fit barrels to Savage bolt actions, and several companies offer prechambered and threaded barrels for just that purpose. The lowest-priced Savage is the Axis model, and I picked one up in .22-250 Remington a couple of years ago, partly because of the price. It shot very well, of course, like most Savages do, but the easy-change barrel option also attracted me.

Eventually I found a brand-new E.R. Shaw barrel of the same contour on the MidwayUSA website, all blued and ready to go, in the classic .250-3000 Savage chambering. For \$120 I couldn't resist clicking on “Add To Cart,” and as soon as there's time to unscrew the .22-250 Remington barrel and replace it with the Shaw, I'll have a lightweight .250 with a modern rifling twist of one turn in 10 inches. No, it won't be a “classic” rifle (the Axis isn't even close), but it will solve one of those “__?” questions, and very affordably. 

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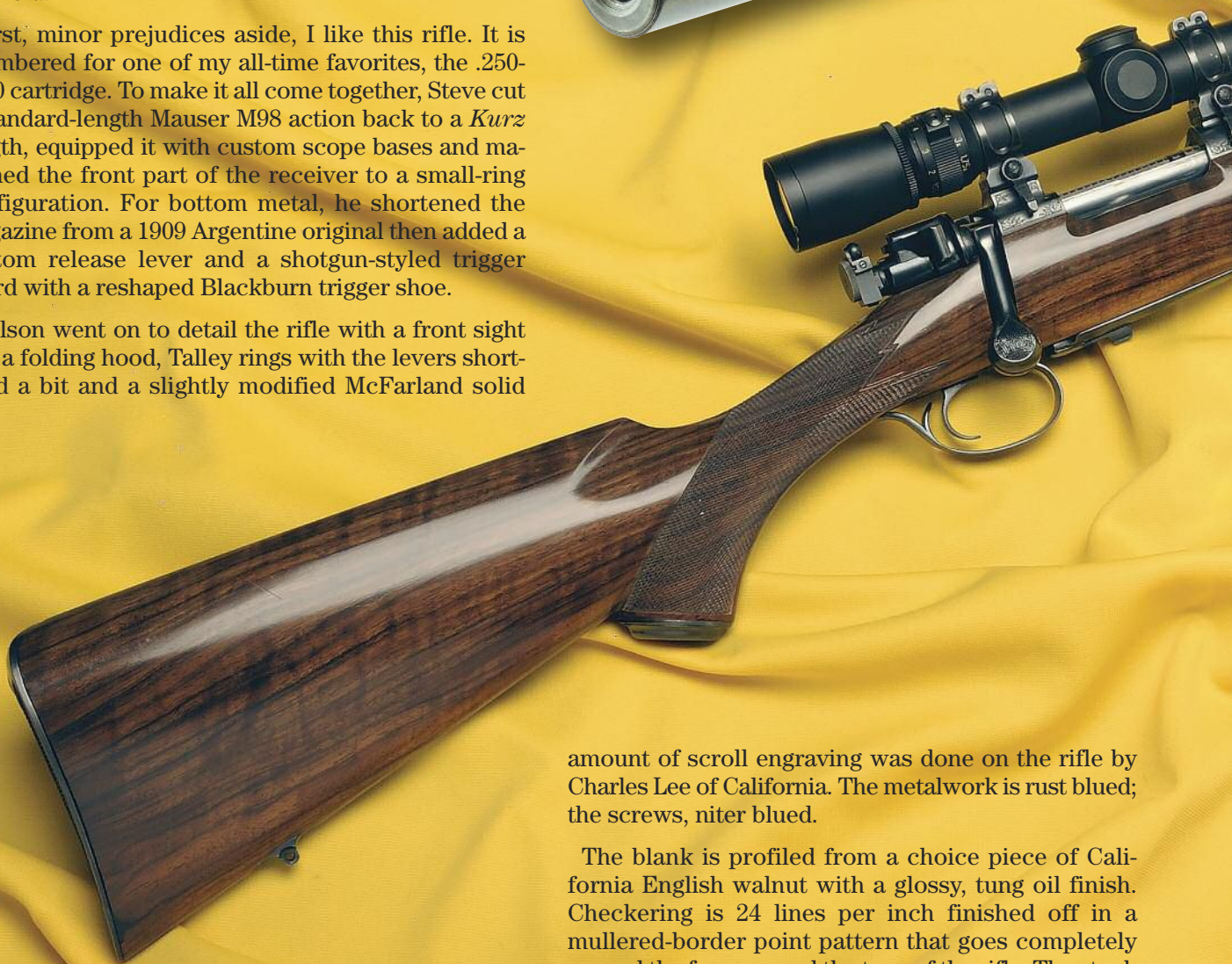
STEVE NELSON'S CUSTOM MAUSER M98

CUSTOM CORNER by Stan Trzoniec

When doing "Custom Corner," I am often asked this question: "Should I build one for hunting, or should I build for art?" This, of course, is a personal opinion, but according to Steve Nelson, whose client is near retirement from the armed services, it seems the client wanted the rifle for hunting duties now and later when he has more time. When I received the rifle, there were some marks of honor on the stock, so apparently the client has had his chance to use it in the field.

First, minor prejudices aside, I like this rifle. It is chambered for one of my all-time favorites, the .250-3000 cartridge. To make it all come together, Steve cut a standard-length Mauser M98 action back to a *Kurz* length, equipped it with custom scope bases and machined the front part of the receiver to a small-ring configuration. For bottom metal, he shortened the magazine from a 1909 Argentine original then added a custom release lever and a shotgun-styled trigger guard with a reshaped Blackburn trigger shoe.

Nelson went on to detail the rifle with a front sight and a folding hood, Talley rings with the levers shortened a bit and a slightly modified McFarland solid



amount of scroll engraving was done on the rifle by Charles Lee of California. The metalwork is rust blued; the screws, niter blued.

The blank is profiled from a choice piece of California English walnut with a glossy, tung oil finish. Checkering is 24 lines per inch finished off in a mullered-border point pattern that goes completely around the forearm and the tang of the rifle. The stock design is pure classic, and there is a well-defined shadow line around the base of the European-styled cheekpiece. A metal pistol-grip cap and an ebony fore-end tip complete the package.

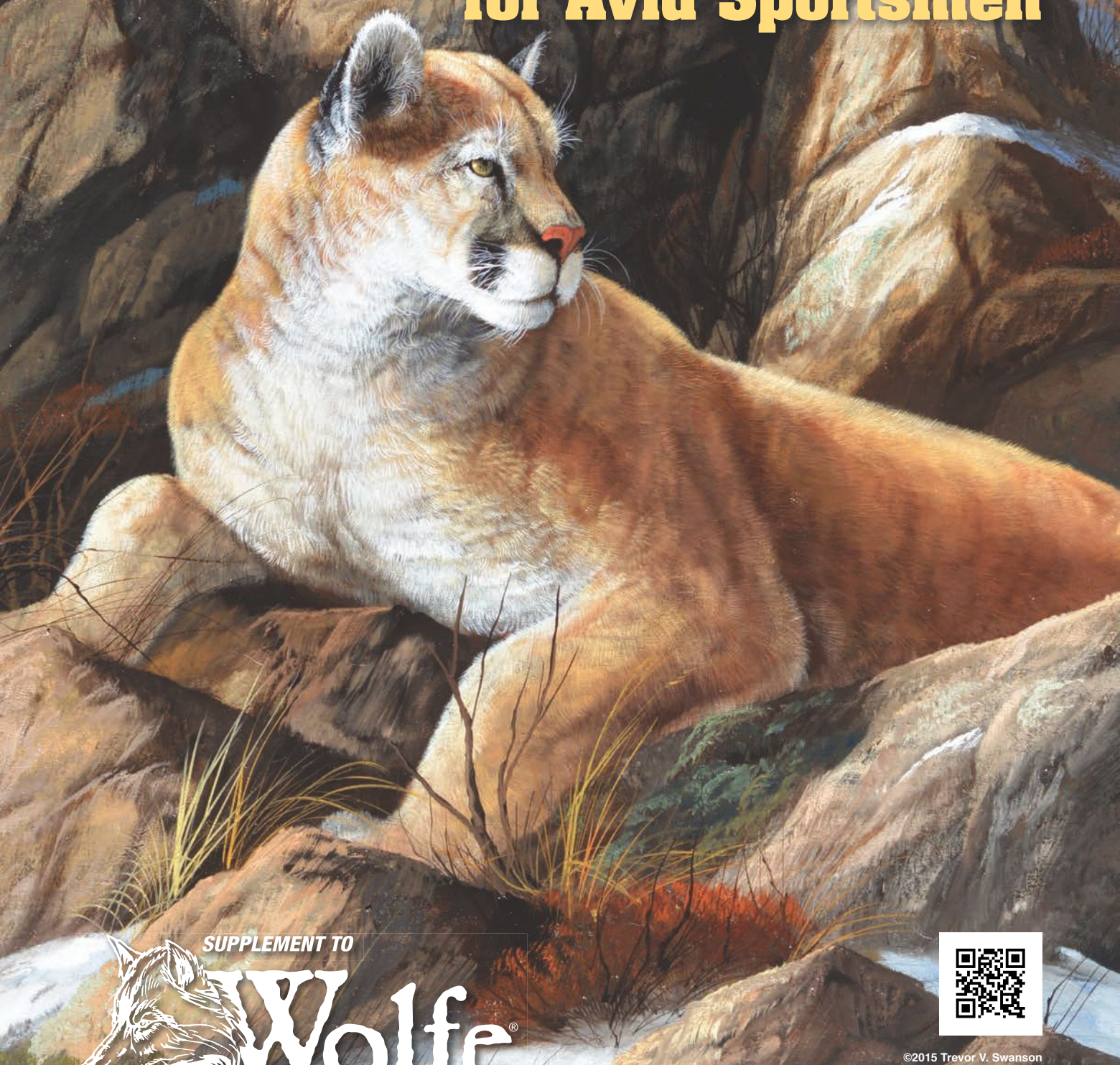
Contact Steve Nelson via e-mail at nelsons-custom@comcast.net.



steel buttplate hand checkered by Nelson himself. While the client chose a Leupold compact scope to highlight the petite size of the stock, the decision was made to incorporate an open sight on the cocking piece of the bolt, which, by the way, moves up and down out of the way when not in use. A moderate



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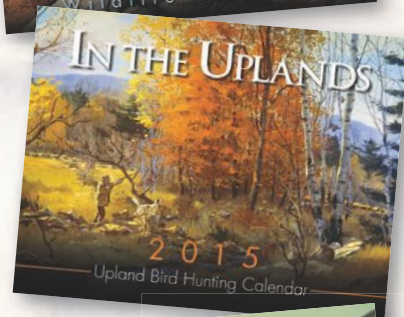
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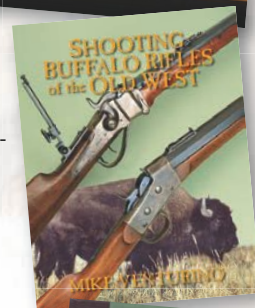


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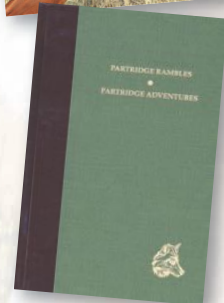


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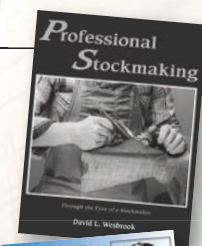
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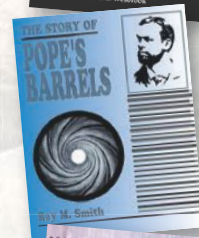


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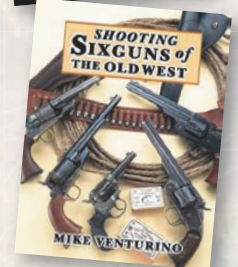
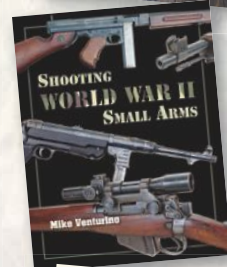
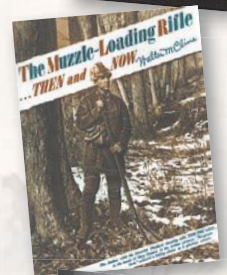
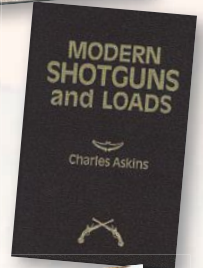
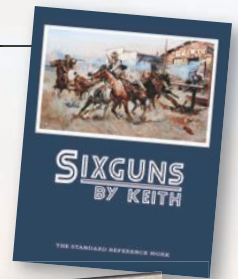
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Shooting Sixguns of the Old West

Mike Venturino

Considered in all its styles and calibers, more SAAs were made from 1873 to 1900 than any other single type of American revolver. However, it was not the only handgun about, nor was it the first revolver to take the then new metallic cartridges. From 1870, when the era of metallic cartridge firing sixguns began until 1900 which is generally considered the end of the Wild West, Colt, Remington, Smith and Wesson, Merwin & Hulbert, and a few other lesser known companies collectively produced hundreds of thousands of metallic cartridge firing sixguns. These handguns were at least of comparable quality to the Colt SAA, and some exceeded it by a wide margin. As far as actually shooting such guns, aside from the Colt Peacemaker, very few Old West sixguns have ever been put back into use. That has started to change, and this has probably come about from the enthusiasm generated by the great sport of cowboy action shooting.

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Reloading

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Fifth Edition

The most convenient reference of powders available to American reloaders from the last 45 years. Includes manufacturers' and authors' recommended loads and tips. Newly revised and updated to include the newer powders.

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REVISED & UPDATED

Pet Loads Complete Volume

Ken Waters

This is Ken's monumental lifetime work in the handloading field. More than just a reloading manual, this large, comprehensive book contains loading procedures, tables, tips, precautions and commentary; over 150 cartridges are detailed. No handloader's library is complete without this comprehensive book. This new updated book incorporates all supplements from #1-#24.

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Ken Waters' Notebook – "Best Wishes for Good Shooting" 1968-1989

Ken Waters

(Brand New Material Never Before Published)

Today's best authority on reloading and firearms reveals his unfathomable knowledge through this chronological catalog of letters. In the tradition of other great shooters' notebooks, this text of letters contains load data, little known facts, history, esoteric details and Ken's personal recommendations to various questions and concerns.

Ken was prolific in his correspondence with extensive details. None of these letters ever appeared in *Rifle* or *Handloader* magazines; it is all new material from the author.

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The Legacy of Lever Guns – Vol. I

This special edition from the folks at *Rifle* and *Handloader* magazines is devoted to America's favorite rifles. *The Legacy of Lever Guns* is a complete reference for loading and shooting lever actions! It is the most authoritative work on lever actions ever, including manufacture dates for various serial numbers. Marlin, Savage, Winchester, Browning and more are covered.

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The Legacy of Lever Guns – Vol. II

Second edition for *The Legacy of Lever Guns* features 108 pages loaded with articles dealing with Winchester, Browning, Savage, Marlin and Mossberg leverguns. Sights, cartridges and loads are also covered for these leverguns.

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Varmint Rifles & Cartridges

These magazines represent a large compilation of the best reports on the subject of varmint guns and loads published in the pages of *Rifle* and *Handloader*. Our experts cover many popular calibers from .219 Zipper and .223 Remington to the .225 and .243 Winchesters and the 6mm-284 wildcat. Each cartridge is covered in great detail from bullet options, powder choices and handload recipes – more than 800 loads!

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Shooting Lever Guns of the Old West

Mike Venturino

300 pages detailing all pre-1900 models of Winchester and Marlin lever action rifles and carbines, plus reloading data on cartridges from the .25-20 to the .50-110.

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Advanced Handloading Beyond the Basics – DVD Video

Wolfe Publishing Co.

Redding, Sierra and Wolfe Publishing teamed up to bring you an advanced handloading DVD. John Barsness hosts this DVD and teaches you how to use advanced tools to make your handloads shoot better. This video covers advanced techniques needed to enhance your ammunition accuracy.

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Wolfe Publishing Company

Casting Premium Bullets for Handguns is a DVD that takes you to a level beyond Bullet Casting 101. This "how to" video explains all the necessary techniques in detail. You'll learn: to cast the highest quality bullets for accuracy; to cast bullets from a single cavity mold to the six cavity gang mold while balancing mold and alloy temperatures.

Catalog # 544.11 **\$20.00**



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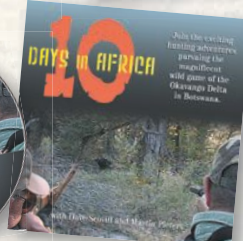
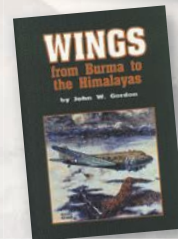
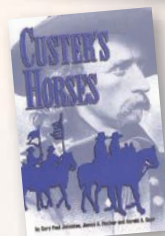
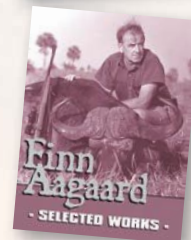
Hunting & Adventure

Trophies and Cartridges

Dave Scovill

This book offers the reader a potpourri of information on an unusual mix of subjects that is sure to help hunters and shooters. Bullet development, gunsmithing tips for your Colt handguns, thoughts on accuracy, trophy hunting, shooting techniques with iron sights, various rifle and caliber commentary for various game, leverguns, cast bullets and hunting tips are just a few of the topics covered. From the author's extensive experience as editor of *Rifle*, *Handloader* and *Successful Hunter* magazines, this book covers subjects usually not offered by other books, which is the purpose of this unique and valuable presentation.

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Finn Aagaard

Fans of Finn's writing will be thrilled to find this collection all in one place. His in-depth approach on subjects, written in his impeccable style, allows the reader entertainment and learning in a neat package. He has tales of leopards, how to manage dangerous game, one rifle/one load, slings in the field, various calibers are covered, killing power myths and, of course, his great African stories, as well as practical chapters. You will love this book, and with its valuable information, it will make a great gift for anyone who enjoys hunting or guns.

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Camp & Trail

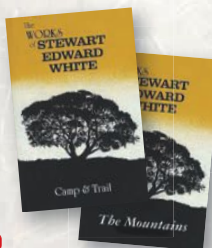
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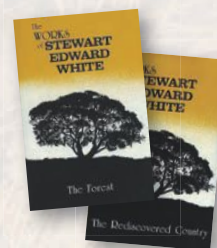


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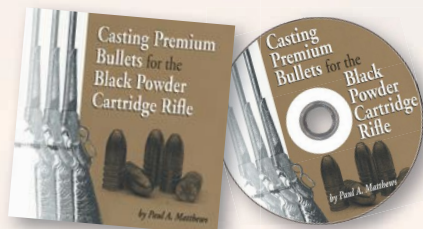
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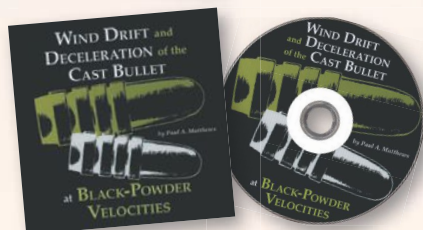


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Paul A. Matthews

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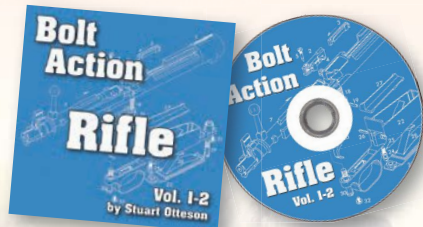


Wind Drift and Deceleration of the Cast Bullet at Black Powder Velocities - CD ROM

Paul A. Matthews

Learn the facts that help reduce wind drift to become a better shooter or cast bullets at black powder velocities. This is the entire book in pdf format on CDROM

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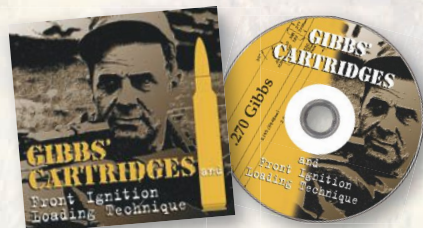


The Bolt Action Rifle I & II - CD ROM

Stuart Otteson

Author Stuart Otteson explores the original records and the bolt-action rifles themselves to reveal the fine nuances of many popular bolt-action mechanisms. The drawings exemplify the study; they were done by working from the guns, not factory drawings, old blueprints or catalogs. Few draftsmen have so clearly and economically delineated firearms mechanisms. The design facts collected and interpreted by Otteson are likewise his, taken directly from the guns. You will find in this book such things as lock times, spring rates and cam angles. There is also considerable historical content. Most of it is based on the record of patents, again personally researched by the author. For the modern actions, the historical recitation is based on the public record and on the recollections and statements of the men who did the design work.

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Gibbs' Cartridges - CD ROM

The Gibbs line of wildcat cartridges has aroused curiosity since the mid-1960s. Handloaders expound and argue the velocity claims and cartridge designs of Rocky Gibbs. Other than this book, only tidbits of information are available. Gibbs had developed his interest in handloading while a member of the Richmond, California, Rod and Gun Club. His competitive nature led to an intense desire to produce a cartridge that was bigger, better, faster and more complete than any other. He was severely criticized for his cartridge case design. Nearly everyone complained about the minimum length of the case necks. Gibbs was also accused of inflating the Gibbs cartridge velocities. He never gave in or broke down in the face of these ongoing controversies. He was willing to risk his reputation to prove he had maximized the available space in a .30-06 case. Whether he accomplished his goal of producing the finest cartridge available is up to each handloader to decide. When it comes to velocity, "a Gibbs chambered rifle with a standard barrel makes a magnum with a short barrel just another rifle."

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This book is a comprehensive examination of a variety of factors – primer, case, shape and weight of the bullet, seating depth, powder burning rate, chamber dimensions and the condition of the barrel – that are investigated in an in-depth study of the velocity and pressure curves. It's a fascinating journey into mysteries of internal ballistics in rifles, shotguns and handguns.

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Franklin W. Mann

This monumental work by Dr. Franklin W. Mann details his experiments with rifles and ammunition. You will be pleased with the level of detail, pictures and other investigations. Loaded with great historical as well as modern technical information, it's a unique and classic addition to any reloader's library.

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Upland Almanac One-Year on DVD ROM

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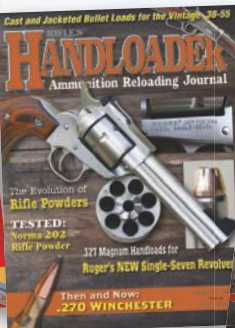
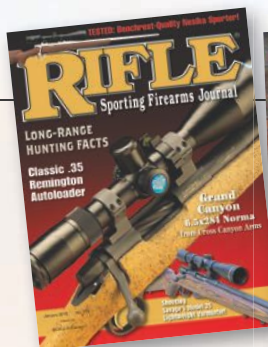
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Wingbeats and Heartbeats is a wingshooter's odyssey to the wild places where, at the end of the day, the companionship of faithful gun dogs and good friends matters more than a bulging game bag. Dave Books celebrates a time-honored connection to the land and the hard-earned hunting rewards of an outdoor life.

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Chuck Martin

An illustrated collection of 33 original stories about bird hunting adventures, love of bird dogs, family values and father-son relationships.

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Woodcock Fieldcraft and Quarry

Professor Colin Trotman

This book was published in the UK and mainly focuses on the Eurasian woodcock, a close relative to the American woodcock. Any hunter of woodcock in North America should find this to be an interesting read. It is a complete roughshooter's guide to a responsible approach to woodcock hunting. The author shares his opinions on the best types of guns, cartridges, gear for the sport and of course, the dogs.

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Dash in the Uplands: Legacy of a Legend Audio Book

Dez Young

Dash (Hank's Dashing Bondhu), son of Hank, star of the television series "Hunting With Hank". This audio book traces Dash's life from puppyhood, through his training, to his travels with Dez Young across the country on television, hunting a wide variety of upland birds. Dash starred in the TV series called "Dash in the Uplands" (first called "Upland Days with Dez and Dash") This audio book is comprised of six CDs. All copies are autographed by Dez and also with Dash's paw print. Total run time: 5 hours

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Mark Parman

Like that earlier grouse hunter Aldo Leopold, Mark Parman takes to the woods when the aspens are smoky gold. Here, in an evocative almanac that chronicles the early season of the grouse hunt through its end in the snows of January, Parman follows his dog through the changing trees and foliage, thrills to the sudden flush of beating wings, and holds a bird in hand, thankful for the meal it will provide.

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Grouse Feathers, Again

Burton L. Spiller

In 1934, Mr. Burton Spiller wrote Grouse Feathers, followed by More Grouse Feathers in 1938. Both books quickly became upland classics. Now, more than 60 years later: Grouse Feathers, Again, a collection of twenty stories from the late Burton L. Spiller, the poet laureate of grouse hunting, that have never appeared in any of his previous anthologies is now available.

Catalog # 700.13 HB **\$45.00**

Hunting the Quails of North America

Ben O. Williams

This is quintessential Ben O. Williams - taut, direct, suffused with earned knowledge, and permeated by a gentle humor. It is a joyous book, brimming with its author's love of life afield, and while easily the most useful guide extant on the subject of wingshooting North American quails, it is also far more than a how-to manual. Six species of quail are covered, exploring the bird's life cycle, and explaining how Williams hunts the bird.

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Shooting Sporting Clays

Mark Brannon & Tom Hanrahan

This is a great how-to book that teaches essential elements in the art of shooting sporting clays, one of the fastest growing shooting sports in North America today. Subjects covered include the 15 basic target types and strategies for breaking them; gun swing and speed for the 3 main swing types: swing-through, sustained lead, and pull-away; how to choose a pump gun, autoloader, side-by-side, or over-and-under; check weight, balance, and fit; and correct stance for the target speed and trajectory.

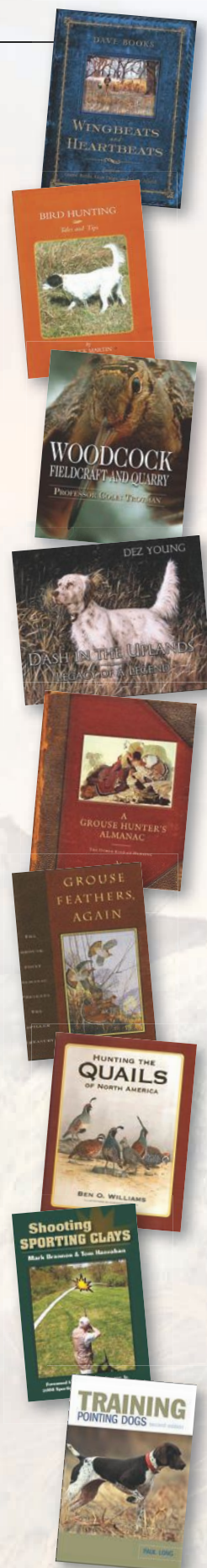
Catalog # 700.2 HB **\$29.95**

Training Pointing Dogs

Paul Long

In Paul Long's heyday as a dog trainer, he was a true "guru" before anyone even used that word to describe an off-sought expert. "What does Paul Long say about this?" was the frequent refrain on training courses, and multiple answers were provided in the original edition of this book. Now reissued, Training Pointing Dogs again delivers the sage guidance of this master dog trainer. In simple question-and-answer format, Long addresses the questions most asked by trainers, professional and amateur alike.

Catalog # 700.5 SB **\$14.95**



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Upland Bird DVDs

My Boys...the best of Hank and Dash

Dez Young

This is a one disc compilation of Dez Young's favorite scenes from the TV shows "Hunting With Hank", "Upland Days with Dash and Dez" and "Dash in the Uplands" (same show, shorter title). He also included his favorite scenes from "Never, Ever Spoil Your Birddog!" at the end of the DVD.

Says Dez, "If you enjoyed watching my boys hunting birds across this great country (and beyond), I'm sure you'll enjoy seeing them again as they perform their job with such great enthusiasm and style."

Each copy is autographed by Dez Young. Run time: 75 minutes

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The Art of Shooting Flying - A Lesson in the Key Points of Instinctive Wingshooting

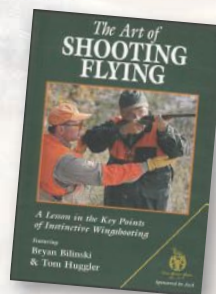
Bryan Bilinski and Tom Huggler

Bryan Bilinski, chief shooting instructor of FIELDSPORT Ltd. is one of America's foremost experts on the Robert Churchill method of instinctive wingshooting. Tom Huggler, a national authority on bird hunting, has written books and produced award-winning videotapes on grouse, quail, pheasant and woodcock. Learn with Tom as he discovers from Bilinski a modified version of how to shoot instinctively - both on the clay target range and in the field.

Dramatic hunting and shooting footage, state-of-the-art graphics and concise instruction - this 2-hour long production will make you a better wingshooter! Learn how proper stance, ready position, gun mount and target concentration merge; how your gun fit plays a major role in success; how to impact test your shotgun; how to identify eye dominance problems and other shooting concerns; why leading any target is the natural result of timing and gun momentum; measuring your shotgun stock and more.

2 hours. Available in DVD.

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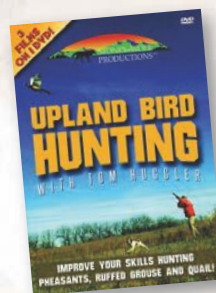
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Join renowned upland bird hunting author Tom Huggler in this trilogy that will make you a better hunter of pheasants, quail and grouse!

Three upland bird hunting programs previously sold separately now available on one DVD. Learn bird hunting tips, habitat assessment and tactics for hunting pheasants, quail and grouse.

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Elk, Mule Deer and Pronghorn Targets (28" x 21")

Place these targets out to 100 yards for a life-size 200-yard look. All vitals are outlined to help measure your accuracy. Whether you are sighting in a new rifle or checking zero on an old favorite, these targets will come in handy for any hunter. Practice different shooting positions to improve on your abilities.

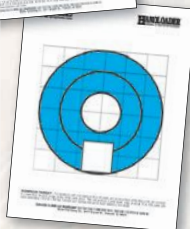
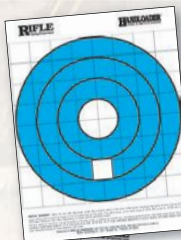
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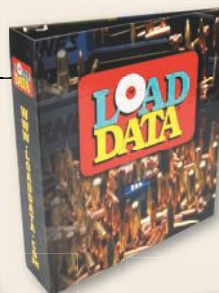
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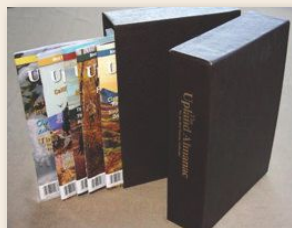
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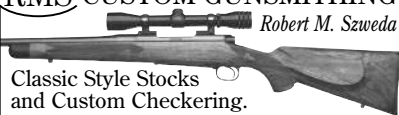
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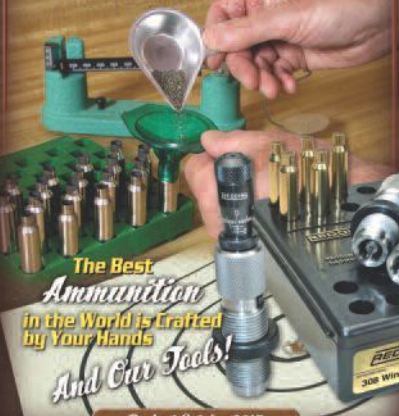
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Spotting Scope

(Continued from page 9)

front sight than smokeless loads for the same bullet weight.

As a result, all my rifles are set up for one load with either smokeless or black powder with one bullet weight. A Browning .45-70 Model 1886 Carbine, for example, is regulated out to 400 yards, give or take a yard or two, with the Buffalo Bore 350-grain load that generates about 2,150 fps from the 22-inch barrel. The caveat is that the issue front sight was replaced with a slightly taller one so the reference lines on the carbine sight correspond closely with the yardage – at 200, 300 and 400 yards.

Rifle sights are graduated in steps for 50-grain increments out to 300 yards. Each notch generally accommodates the trajectory of the standard black-powder or smokeless load, but if the bullet weight and velocity are changed much from the standard for the caliber of interest, the steps must be adjusted – with a small file.

As an example, a USRAC .45-70 takedown rifle with a 26-inch barrel was used to work up loads for the Nosler 300-grain Partition with VV-N133. The first order of business was to make up a taller front sight so the notch increments corresponded with the bullet trajectory out to 300 yards or so. The final load that pushed the Nosler bullet 2,350 fps or so was used to take a young bull elk at 147 yards and a mule deer at 197 yards, both distances being measured with a rangefinder.

The .45-70 barrel was then switched with a .50-caliber, 26-inch half-round, half octagonal Badger barrel with an 18-inch twist. Various brands of black powder, bullet hardness and primers were experimented with until the rifle would print inside 2 inches at 100 yards for 10 shots without a blow tube or wiping the bore between shots. The final load used a compressed (.5 inch) charge with 105 grains of Swiss 1½ Fg and a .030-inch vegetable wad over a

Federal 215 primer. To correspond with the notches on the rear sight elevator, the front sight was replaced with a much shorter version fashioned after the standard sight on a C. Sharps .50 that was used to take a one ton+ bison broadside through both lungs at approximately 200 yards. Each notch on the elevator represented 50-yard increments. After nearly a year of experiments, and shooting upward of 300 rounds with the RCBS 50-450-FN bullet (BHN 19), the rifle went to Botswana to collect Cape buffalo and a variety of plains game, from point blank to just a step or two shy of 200 yards. (See the video *10 Days in Africa*.)

The same rifle was then outfitted with a half-round, half octagonal .475 Turnbull Badger barrel, and the sights were calibrated for a 400-grain Barnes Triple-Shock and banded solid, both at roughly 2,100 fps, and an RCBS .475-450-GC cast bullet at 2,150 fps. Notches on the rear sight elevator closely accommodated the Barnes bullet in 50-yard steps to 300 yards, and the cast bullet to about 250 yards.

The .475 Turnbull collected two cow elephant, between the eyes at about 14 and 20 yards, respectively, a Cape buffalo at ±90 yards, a broadside ear shot on a bull hippo at 90+ yards, a waterbuck at 75/80 yards, a bushbuck at 90 yards and a rapidly departing impala at point blank range. (See the video *The First Season*, Safari Press.) With the exception of the waterbuck, all those animals took one shot and dropped.

All in all, working with that particular USRAC Model 1886 rifle proved beyond any doubt that the .50 Black Powder Express and/or .475 Turnbull can easily take any animal on earth. The caveat, of course, is that there is only one rule for developing good accuracy with smokeless and/or black powder: There are no rules. Well, there may be one rule. Forget everything you knew about developing high-power smokeless powder loads for bolt-action rifles. 

Down Range

(Continued from page 15)

"need" for a G43 or K43 became evident. They are not uncommon, but like most of Germany's weapons from that era, their prices are high for good condition samples. I finally settled on one by BLM marked K43 with the code of "gve" and dated 45. Interestingly, its serial number did not have a letter afterward as is usual for German weapons of the war era. A look in *Hitler's Garands* gave the information that BLM went to numbers only in February 1945. So mine was made in the last three months of the conflict. Its crude manufacturing quality is evident. On the plus side, the rifle carried the "Durofol" hand-guard, a synthetic material found only on the BLM rifles.

As said, all G43s/K43s were set up for scope mounting. Some in the German military actually envisioned issuing every one scoped and ready to serve as sniper rifles. Unfortunately, the average level of precision most G43s/K43s were capable of with standard ammunition prevented that. Mine, with its issue open rear sight and post-type front, was a three-MOA grouper with good handloads. I actually paid \$1.00 more than the rifle cost for a scope and mount. That reduced groups to about two MOA.

Initially, case ejection was amazingly violent. I was afraid flying brass would break a window in my "Shooting Shack." Late war K43s are also said to be prone to parts breakage due to age and poor quality steels used near war's end. So upon discovering an Internet business selling "G-43 Shooter's Kits" (www.apfeltor.com) I purchased one. An item in the kit is a plug to completely cut off the gas system, turning the rifle into a manually operated repeater. At this writing that is how my K43 remains in deference to its value.

German manufacturing records were in disarray after the war, but informed sources estimate G43/K43 numbers at about 400,000 to 500,000. Mine fills an obvious gap in my World War II collection. 



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Walnut Hill

(Continued from page 70)

tive side, however, they are heavier, which in turn requires stronger mounts; they have to sit higher on the rifle, are bulkier overall and generally get in the way.

Early hunting scopes had tubes of 5/8-inch or 3/4-inch diameter; these were followed by 7/8-inch, then one-inch. In Europe, the early standard was 26mm (slightly larger than an inch, which is 25.4mm) which was then superseded by 30mm. Various optics books explain in technical detail all the gains derived from larger tubes, but for our purposes, that hardly matters. What we're concerned with is usability, and the simple truth is that, as tubes get larger, usability decreases significantly.

It's not only the tubes that get larger. Ocular bells (the end you look through) become bulkier, and objective bells even more so. Both require that the scope be mounted higher. On a bolt action, the ocular bell can get in the way of the bolt handle, but even on other types of rifles, it can obstruct vital functions like the safety or cocking piece.

Heavier scopes have greater inertia, so when a rifle recoils, the scope wants to stay motionless. This places greater strain on the mounts – hence the need for stronger, larger, heavier mounts. Mounting the scope higher increases this effect further through greater leverage. And, by the way, fitting a powerful rifle with a muzzle brake does not help. Quite the opposite: It increases the stress by introducing a third, vicious jerk to go with the existing action and reaction.

Sometimes, improvements in performance prove to be ephemeral. The Swarovski Z6 scopes profess to offer greater eye relief, but this is in theory only. The greater length of the ocular bell prevents the scope being mounted far enough forward to take advantage of it. In fact, on most rifles, the position of

the mount puts the bell so far to the rear you have to pull your head back to see through it. Putting one of these on a hard-kicking, dangerous-game rifle, for which the 1-6x is designed, not only makes it awkward to use, but it can also be dangerous to the shooter who, in the excitement of the moment, may have his eye too close to the scope.

In Spain last year, hunting in the mountains, I was supplied with a Blaser R8 .300 Winchester Magnum fitted with one of the new Zeiss V8 scopes – a 2.5-20x56 monster, attached by a rail, complete with illuminated reticle and a target-style, external adjustment elevation turret. The scope and mount not only added more than 2 pounds to the weight of the rifle, but it also made it impossible to carry normally, switching from hand to hand for balance. Carrying a rifle slung is bad on a treacherous mountainside. It was not easy to sight through, since the eye relief seemed unduly critical, and picking up a strange animal in unfamiliar terrain was very difficult.

I set the scope at 8x for my sighting shots, then reduced it to 4x for carrying so as not to have it set

too high in case we jumped an ibex at close range. Because the elevation turret could be adjusted without removing a cap, it was vulnerable to accidental changes. These are all too possible when carrying a rifle slung on the shoulder, and that was something else to worry about, to check constantly and be distracted by when least desired.

This target-scope feature, which allows instant adjustment for range, is now found on all kinds of alleged hunting scopes. Again, if all you do is sit in a stand and have nothing better to do than check the setting to make sure it hasn't moved, then it may be acceptable. On rifles that are carried in the hand, up hill and down dale, where the turret can be accidentally twirled, it is just one more thing to go wrong.

Is the Zeiss V8 a wondrous optical instrument? Indeed it is – as are the Swarovski Z6 scopes I've used. What I question with the extreme variability, however, is the actual usefulness. How often will a Z6 1-6x ever be set at 1x? Or the Zeiss V8 at 2.5x? And yet, if you do want to use that setting, you do not have the compact usability of

a 2.5x – you have the heavy, awkward bulk of a 20x.

Two situations today in which hunters might use a low-power scope are driven-boar hunting at close range or jumping a white-tail in a thicket. For those purposes, these monsters are almost unusable.

For the record, when I did shoot an ibex, it was at 100 yards in broad daylight. Having been burdened with that rifle for two days, in the end I could have shot the animal with a .30-30 WCF and iron sights. Three other hunters on the same trip also shot ibex. One was at 100 yards, the other two around 250.

To say I was seriously overgunned and over-scoped is an understatement. Left to my own devices, knowing what I now know, what would I have taken? A Winchester Model 70 Featherweight in .270 Winchester with a one-inch 2-7x would have handled any shot I saw. Or, to go the European route, a Blaser R8 7x64 with a conventional low-power Zeiss would have been ideal. In this case, less is not just more, it's a lot more.

R

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AD INDEX



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OVER-SCOPED AND UNDER-SERVED

WALNUT HILL by Terry Wieland

A half-dozen years ago, Swarovski Optik broke new optical ground with a line of riflescopes designated "Z6." The series of variables offered the heretofore unheard-of multiplier of six, as in 1-6x, 2-12x and 3-18x. Rivalry between European optical companies being what it is, others immediately raced to top this. Zeiss, the *Tyrannosaurus rex* of the optics world, responded with its V8 series, which offers a multiplier of eight (2.5-20x, etc.). All this would be fine, and even laudable, were it not for the uncomfortable fact that, in optical science, everything comes at a price.

There are many desirable qualities in a riflescope beyond the resolution of the glass, and most of these are at war with one another. Increase one thing and you reduce something else; alter a third to improve the second, and chances are a fourth is impaired.



Terry used a Blaser R8 .300 Winchester Magnum with a Zeiss V8 2.5-20x56 atop the European rail system. The scope and mount add 2 pounds to the weight of the rifle, and its bulk makes carrying the rifle difficult, especially in treacherous terrain. It's a wondrous optical instrument but not a great hunting scope for anything except sitting in a stand.

To be useful, a riflescope needs sufficient optical quality to ensure a sharp, detailed picture of the target. It also needs a reticle that is

easily seen. Beyond those basic requirements, almost everything else is optional. What extras you can have depends to a great extent on what features you are willing to sacrifice to get them. Those, in turn, depend on the kind of hunting you do.

The trend today is toward scopes suitable for snipers, long-range target shooters, shooting from a bench or, at most, climbing into a tree stand. Fewer and fewer are made with the backpacker, horseman, mountain climber or still-hunter in mind. Modern scopes are unavoidably bigger, longer and heavier. The old American standard one-inch tube scope is being steadily displaced by 30mm tubes. With the Zeiss V8 series, we now have 36mm tubes.

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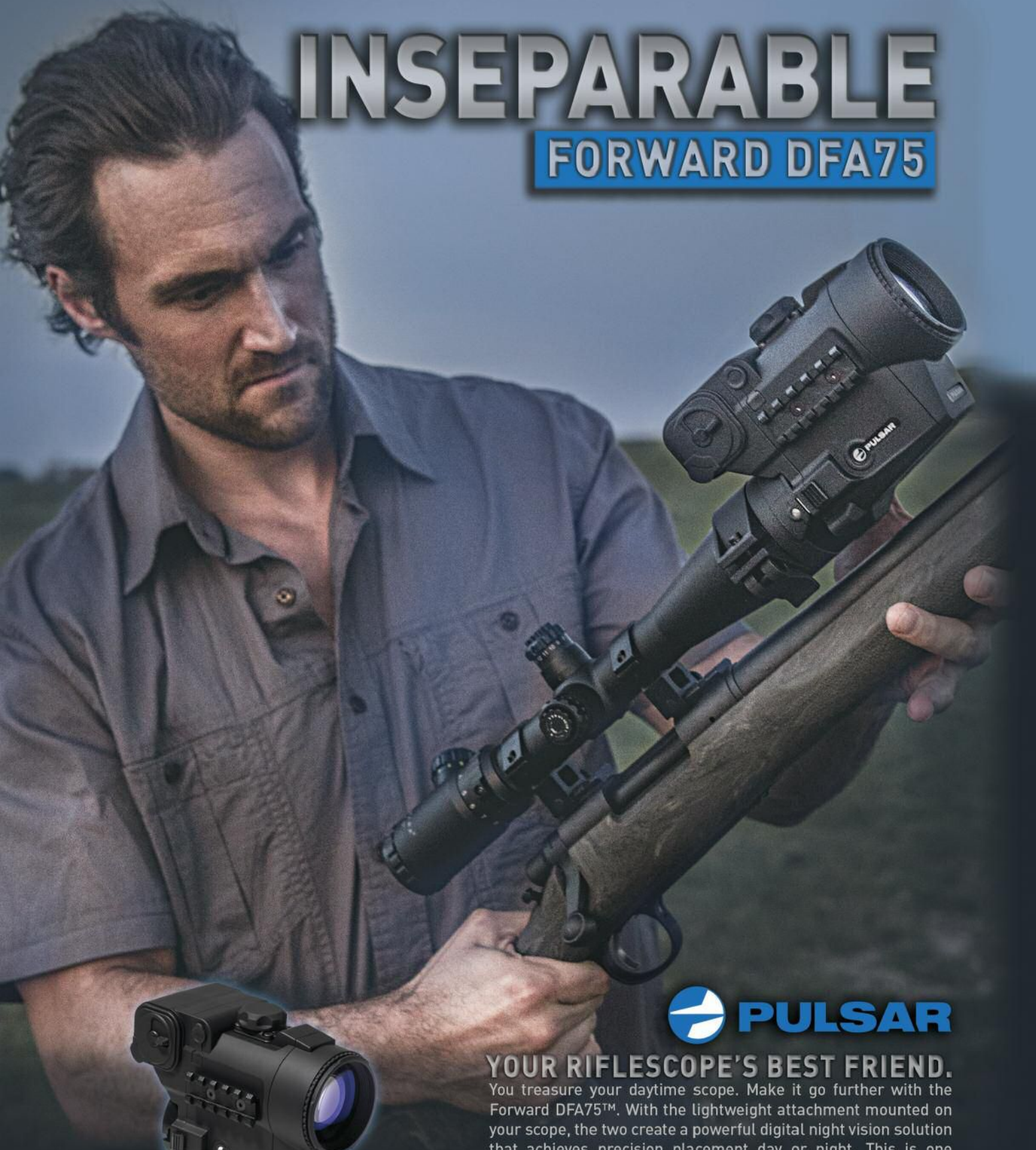
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